

THE SUPPLEMENT  
TO THE  
UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE INFORMATION OF

THE HOSPITAL CORPS  
OF THE NAVY

---

ISSUED BY

THE BUREAU OF MEDICINE AND SURGERY  
NAVY DEPARTMENT

DIVISION OF PUBLICATIONS

CAPTAIN J. S. TAYLOR, MEDICAL CORPS, UNITED STATES NAVY  
IN CHARGE

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EDITED BY

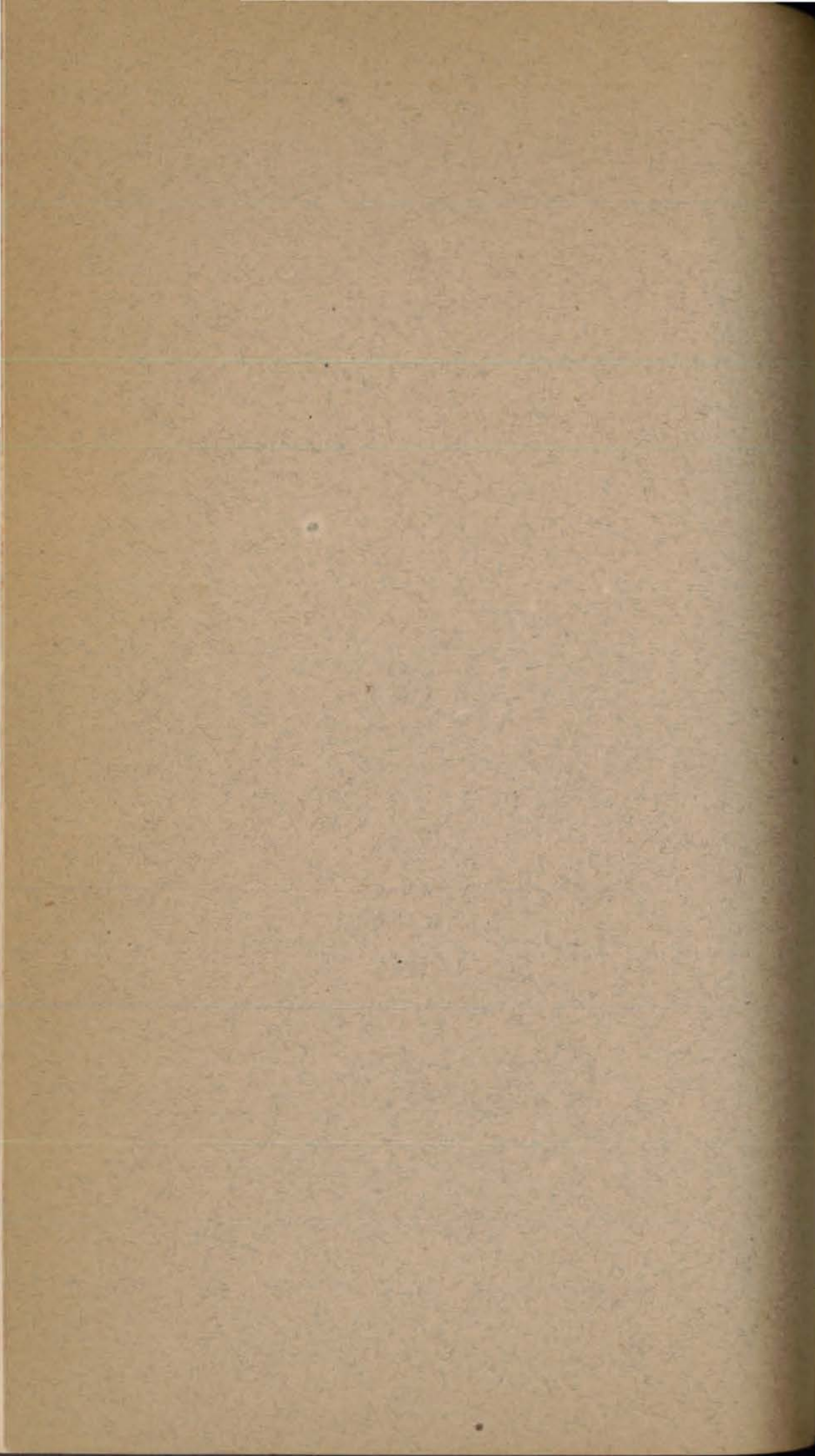
LIEUTENANT COMMANDER G. F. COTTLE, MEDICAL CORPS  
UNITED STATES NAVY

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APRIL, 1919  
(NUMBER 9)



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
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NAVY DEPARTMENT,  
*Washington, March 20, 1907.*

This United States Naval Medical Bulletin is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,  
*Acting Secretary.*

#### SUBSCRIPTION PRICE OF THE SUPPLEMENT.

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## PREFACE.

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From the first issue of the United States Naval Medical Bulletin it has been intended as a vehicle of communication with the Hospital Corps, and to be the means of imparting information and instruction to it as well as to the Medical Corps of the Navy. The recent expansion and improvement of the Hospital Corps seems now to justify more direct methods and the material prepared for that body will hereafter be issued in the form of a SUPPLEMENT.<sup>1</sup>

Contributions for the SUPPLEMENT are desired from members of the Hospital Corps and from other sources, but the Bureau does not necessarily undertake to indorse all views and opinions expressed in these pages.

W. C. BRAISTED,  
*Surgeon General United States Navy.*

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<sup>1</sup>The present issue is No. 9. Nos. 1 and 2 appeared incorporated in the July and October issues, 1917, respectively, of the United States Naval Medical Bulletin.

## PREFACE

The first book of the *Journal of the Royal Society of Medicine* is a volume of 1,000 pages, containing the proceedings of the Society from 1850 to 1851. It is a volume of the *Journal of the Royal Society of Medicine*, and is the first of a series of volumes, each containing the proceedings of the Society for a year. The volume is published by the Royal Society of Medicine, and is sold by the Royal Society of Medicine, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

W. G. Lister.  
London: Royal Society of Medicine, 1851.



## RECOLLECTIONS OF DUTY IN THE SOUTH SEAS.

By L. C. SIMS, Lieutenant (T) Med. Corps, U. S. Navy.

A year ago a number of photographs of Samoa were published in the SUPPLEMENT. A sketch of some of the activities of a hospital corpsman on independent duty in the Samoan Islands may be of interest and I will give a few of the more interesting features of my tour of duty there as I remember them.

In January, 1914, I was ordered to Samoa for duty in company with another hospital corpsman. After our arrival at the United States Naval Station, Tutuila, Samoa, I learned that we had been sent for the purpose of establishing and going on duty in two dispensaries in outlying districts of the islands.

The United States, through the Navy Department, exercises, at the request of the natives, a protective form of government over the group of Samoan Islands known as American Samoa, which comprises the island of Tutuila on which the naval station is situated, and a group of three islands known as the Manua groups, about 70 miles from the island of Tutuila.

A naval officer acts as governor of American Samoa and as commandant of the naval station. In return for the use of the beautiful harbor of Pago Pago (pronounced Pango Pango), and the privilege of maintaining a wireless plant and coaling station, this country looks after the welfare of the native inhabitants and generally supervises the native community's form of government.

Naval medical officers, hospital corpsmen, and Navy nurses are detailed to look after sanitary conditions and care for the physical welfare of the natives. To this end a native hospital has been established at Pago Pago under the charge of a naval medical officer assisted by hospital corpsmen and Navy nurses, and many hundreds of cases are treated here yearly. A modern drug store, also managed by the medical officer and operated by hospital corpsmen, has been established in connection with the native hospital and the revenue from this source has been sufficient for the past two years to pay practically all the operating expenses of the hospital, to erect new store buildings besides, and to lay aside quite a sum of money for a sinking fund.

The two dispensaries to be established were for the purpose of extending to the natives in distant portions of the islands the bene-

fits of the same medical attention available to the natives living closer to the naval station.

In order that I might familiarize myself with native customs, diseases peculiar to the islands, and gain a little knowledge of the Samoan language I was detailed for a few weeks' duty in the naval hospital where I also attended the daily clinics to study the management of the common island diseases.

In April, 1914, I boarded the station tug with a naval medical officer and sailed for Manua where I was to open the new dispensary.

This group of islands had, a month prior to my arrival, been struck by a hurricane which destroyed the coconuts, taro, bananas, plantains, breadfruit and in fact practically the entire food supply of the natives, as well as the native homes. On the tug we carried three months' supply of food for the 2,000 Manuans donated by the American Red Cross and the Navy Department, and therefore the welcome was doubly sincere. I was introduced to all the native chiefs and felt quite important upon being toasted by the native governor as the "foma'i sili." Doctors are known in Samoa as "foma'i sili" the natives assigning to the naval medical officers the title of "foma'i sili" or high doctors, while hospital corpsmen receive the title "foma'i lua" or doctors number two. Being the only representative of the medical department in Manua I was here the "foma'i sili."

I soon learned that the Samoan is a confirmed flatterer, especially when he desires something, and he will cheerfully assign the highest title known in Samoa to the prospective donor and as soon as out of hearing will to his fellows refer to the American as the "papalagi" or foreigner, a designation not meant to be flattering.

I found upon arrival in Manua that no provision had been made for my accommodation and I was forced to have my medical stores stacked under the coconut trees on the beach while I moved into a native house with coral floor, grass roof, and no side walls.

The medical officer who made the trip with me made arrangements with the native governor to turn over for my use the only European building on the islands, which had formerly been used as a store. It was roofless from the storm, but the natives replaced the tin roof in spots, whenever they found a piece of the metal which had formerly covered the building. Some of this metal had been blown 15 miles by the hurricane. This building then became hospital, dispensary, living quarters, and storehouse for the natives' food supply.

I was given the custody of the food supply with instructions to make it last at least three months, when more would be sent if necessary. Fortunately the natives were not given charge of the food, their policy being "give us this day our daily bread and let tomorrow take care of itself," and for a few days I was begged, threatened and cajoled to turn over to the natives that which they assured me



belonged to them. I set a certain day of each week for the issue of the food, computing as equitably as possible the correct share for each village based on population. At the first issue, which took place the day after my arrival, I turned over to each village chief his village share and saw 2,000 hungry natives immediately devour the entire week's supply, whereupon for the rest of the week they lived on shark meat and memories of that one grand feast.

After I had established myself in my permanent quarters and had unpacked my medical stores I found a native boy who had a very slight knowledge of English which he had learned at the government school in Tutuila. Through him I announced to the natives the day of my opening clinic or "sick call." When I opened the dispensary doors that morning I found 2,000 natives, or the entire population of the Manua Islands waiting for treatment. Cripples who had not walked for years were carried in, blind from all parts of the islands were led to the new "fale ma'i" or hospital. Three insane patients whom the Samoans assured me were full of "aitus" or devils were brought for me to exorcise the evil spirits. In the hopeless cases the natives accepted philosophically my statement that I could do nothing for the sufferer, one crippled woman laughing heartily when I told her I could not remove the hump from her back.

I worked that first day. Ringworms were painted with iodine until half the population looked like Indians painted up for a war dance. Old tropical ulcers which had not been covered, except by flies, for months were cleansed and dressed. A great many cases of Samoan conjunctivitis caused by the *diplococcus Samoensis* were treated with protargol solution, protargol being a specific for that disease. After seeing the large number of blind natives who had lost their eyesight from lack of treatment when suffering from conjunctivitis I felt that if I did nothing else but treat sore eyes during my stay I would not have been sent in vain. This disease greatly resembles gonorrheal ophthalmia in appearance and results, only it is less acute and not of venereal origin. It is endemic in Samoa, becoming epidemic in fly time. Untreated it nearly always results in impaired vision and often in total blindness. After working until late in the afternoon with no appreciable diminution in the size of the crowd I came to the conclusion that unless I separated the sick from the curious I would never complete my first clinic; moreover my medical stores were diminishing at an alarming rate. I was unsuccessful in this respect, however, and was forced to make my first appearance practically a continuous performance until I had done something for each of the natives.

I made a serious mistake the first day by applying a belladonna plaster to the back of a husky-looking chief who assured me his back pained him so he was unable to sleep, as thereafter I was forced to



refuse the request of some hundreds of natives for "paper backs" as they called them. The sick forgot all their other ailments and immediately became afflicted with terrible pains in their backs in order to obtain the coveted paper back. The chief on whom the plaster was applied wore it until it fell off.

After a few weeks' study and observation of the native character I became quite proficient in separating the truly sick from the malingerer. I also saved a large amount of Government stores and medicines by the judicious use of a very weak solution of quinine faintly tinged with colors taken from the microscopic case. The natives came to have great faith in my blue solution of quinine, principally, I imagine, because of its intensely bitter taste and attractive blue color, and I have had very sick persons express their dissatisfaction with the treatment I was conscientiously administering them and demand the "blue vai" (medicine).

Potassium iodide is in great demand and is a godsend to the natives suffering from tertiary yaws and the consequent ulcers. I always kept on hand a bottle of saturated solution of "K. I.," which I diluted well before giving to my patients. One young man, going on the theory that if a little medicine was good a lot would surely cure, abstracted my bottle of saturated solution and took at one dose what I estimated to be about 50 grams of the drug. He promptly developed a severe case of iodide poisoning. The symptoms were intense headache, ptialism, salivary glands swollen to a very large size, coryza, eyes swollen shut, and inability to swallow. In a few days he had recovered, and incidentally there cleared up on his leg an ulcer of several months standing.

Another milder case of iodide poisoning occurred after a comparatively small dose of the drug. It presented all the symptoms of the first case, but puzzled me on account of the size of the dose which had brought on the symptoms until I read up on the drug and learned that when administered with potassium chlorate poisoning often results. I had given this case a number of potassium chlorate tablets for sore throat while he was taking the course of "K. I."

I was called in at a number of obstetrical cases, but owing to my lack of experience I seldom interfered with the native midwife. When a Samoan child is about to arrive the mother is placed in the center of the one room of the native house, while all the relatives and friends, male and female, children and adults, gather about her and cheer her up during the ordeal of which the old midwife is in direct charge. The following day, or the day after, the mother takes her infant, creeps down to the sea, and bathes herself and babe.

Hookworm is prevalent, especially in the Manua group, this disease and many of the other ills being due to total lack of sanitary precautions. There are no toilet facilities, and the beach in the front





NATIVE CARRYING BANANAS.



NATIVE FISHERMEN.



Courtesy of P. Blakiston's Son & Co.

ELEPHANTIASIS.

From Stitt's Diagnostics and Treatment of Tropical Diseases.



of the villages is used as a latrine and lavatory. All food is consumed on the floor of the house without any utensils, such as knives, forks, or spoons. A polished coconut shell serves as the common drinking cup. Flies are extremely thick, especially during the breadfruit season, and no effort is made to destroy these pests, the natives being averse to killing a fly for some unknown reason. Many children were brought to the dispensary suffering from a purulent discharge from the ears, and upon irrigation numerous flies and others insects were washed out, to the great relief of the child. Flies are the direct carriers of the Samoan conjunctivitis.

All native children, and adults too, for that matter, have intestinal parasites, the more common being whipworm, ascaris, and hookworm. A routine measure in treating Samoan children for any sickness is a dose of santonin and calomel. I never saw any bad results follow the use of these drugs, nor did I see any cases of santonin poisoning while in Samoa. The dose commonly given a healthy Samoan child is one-half grain of santonin and a grain of calomel, repeated every few days for a week or two.

The most common emergency cases which I was called upon to treat were due to fish poisoning. Several times I have seen practically an entire village poisoned from eating various kinds of fish. One of the most dangerous species commonly eaten is a kind of red snapper. Another frequent source of fish poisoning is shark liver. The shark is considered a great delicacy by the Samoan and the liver is the food of foods. Unless the liver is parboiled very soon after the fish is killed it almost invariably makes the consumer very sick, probably because of the rapid decomposition of this part of the fish in the hot climate of Samoa. Needless to say, the natives seldom take the precaution of cooking the fish until they are ready to consume it. The most common symptoms I observed in a large number of cases of fish poisoning were severe cramps, followed by nausea and tingling, cramps and numbness of the extremities, constant pain in the back, and often a paralysis of the limbs lasting anywhere from a few days to several months, depending on the severity of the case. Ipecac freely given soon after the fish is eaten, followed by salts or castor oil, and if recovery is not prompt, a course of potassium iodide, seemed to be satisfactory in most of my cases. I saw no fatal cases during my stay in Samoa.

The following incident will serve to show that the Samoan appreciates the value of modern prophylactic medicine: Three young men of the village called at the dispensary one day and asked me for "vai pua'i," which name they had given to ipecac because of its emetic properties. They showed none of the symptoms of poisoning, and I asked them why they wanted "vai pua'i." They told me they had been poisoned from shark liver. I had seen no shark brought into the



village, but glancing from my front door I saw two fishing boats approaching, in which the fishermen were tossing their oars and slapping the water in the peculiar manner which is customary when a shark has been caught. Upon further questioning my patients I found that they had decided to take the ipecac and get the ordeal of emesis over with, thinking they would then be able to eat the questionable food with impunity.

Devil doctoring or treatment of the sick by natives to whom was attributed special power against the "aitus" or devils whom the natives believe are the cause of all sickness, was formerly common in Samoa before the American Government took charge and gained the confidence of the natives. Devil doctors are under the ban of the Government, but I saw evidences that their practices are still carried on secretly. The devil doctor does not hesitate to feed his patients poison herbs with the idea that if the patient dies the devils will also necessarily be killed. I have been told by natives that the favorite treatment of a Manua devil doctor for conjunctivitis was to scrape the inflamed conjunctiva with a sharp clam shell, and that insanity or headache was treated by puncturing the ear drums with a sharp bamboo stick to let the devils out.

Framboesia or yaws is so common a disease in Samoa that mothers have often asked me for medicine to cause the baby to break out with the yaws eruption, thinking that like teething, the child is not progressing normally until it is over with. The disease is caused by a spirochete (*treponema pertenue*) which resembles the *treponema pallidum* of syphilis. It is transmitted by direct contact, but is non-venereal in the sense that it is usually acquired innocently. It makes its appearance by an eruption of a sore or sores called "tonas." The initial tonas have a characteristic appearance, being moist, offensive sores which are covered by a thick greyish white membrane. The sufferer may become so thickly covered with the sores as to resemble a case of smallpox. The disease is intractable to treatment excepting by mercury, potassium iodide, or salvarsan. Mercury with iodide of potash is a cure if continued over a long period, but salvarsan works wonders in curing the disease, one injection clearing up the sores as if by magic. In Manua I was unable to obtain salvarsan because of war conditions, and had to depend on mercury and iodide of potash in treating my cases.

Tertiary yaws which appears in adult life shows, among other symptoms, a peculiar "eaten" condition of the soles of the feet. The thick calloused skin on the feet of the barefoot natives appears to be eaten away in spots and the tender skin beneath cracks deeply, becoming very painful. Tertiary yaws responds to mercury and iodide of potash. Salvarsan effects a quick cure.





FRAMBOESIA OR YAWS. SAMOAN CHILD.

From Naval Medical Bulletin.



FRAMBOESIA OR YAWS. SAMOAN CHILD.  
Naval Medical Bulletin.

Filariasis, a disease caused by the filarial parasite, which is carried by mosquitoes, is prevalent. The symptoms of filariasis closely resemble those of malaria. The acute attack comes on with high fever and chills, the fever in some cases going to  $110^{\circ}$ . Under the microscope a drop of the sufferer's blood shows the microfilaria swimming actively about in the blood plasma. In Samoa the microfilaria can be demonstrated in the blood night or day, although it is classified as the *filaria bancrofti*, which supposedly is only demonstrable in the blood of the victim at night. Abscesses commonly occur in filariasis and upon incision are found to contain a suprisingly large amount of pus. Sometimes dozens of these abscesses appear on the body during one attack of the disease, and unless incised break down, causing foul discharging sores.

Elephantiasis, believed to be a sequence of filariasis, due to the blocking of lymph channels by the adult filarial worm, is also common. This disease is characterized by enormous swelling of the part affected. The only known treatment for elephantiasis which appears to have good results is the removal of the elephantoid tissue by the surgeon's knife.

Leaving the medical side of the joys of Samoa I feel it would not be fair to Samoa to fail to mention the island beverage, kava, and that curious Samoan edible, the palolo.

Kava is the dried rhizome of *piper methysticum*, and is also the name given to the drink, made from an aqueous mixture of kava. Kava drinking among the Samoans is a ceremony, only to be indulged in by adult males. In former days when a native "fono" or chiefs' council was held each chief present brought with him his "tapou" or kava maid, and a pieve of kava. The chiefs seated themselves in a circle and the pieces of kava root were collected by the "tapous," ground to a mass between their strong molars and deposited on a banana leaf before the high chief's "tapou," who placed the pulverized root in a large, legged, wooden bowl. Water is poured in the bowl and the girl macerates the root for some time, finally straining out the particles of root from the opalescent liquid; it is then ready to drink. It is served by the "tapou" to the chiefs in order of their standing with much bowing and complimentary toasts. The missionaries and medical officers have taught the natives that the old method of grinding the kava by mastication was not in accordance with the best social customs, and now the natives grind the kava in a hollowed stone, mortar and pestlewise. I have heard some Americans describe their first drink of kava as tasting like soapsuds. Others say it has the flavor of varnish, but a liking for it is soon established and some Americans become confirmed kava drinkers, often consuming a gallon or two a day without noticeable ill effects. The native method of preparing the infusion being too

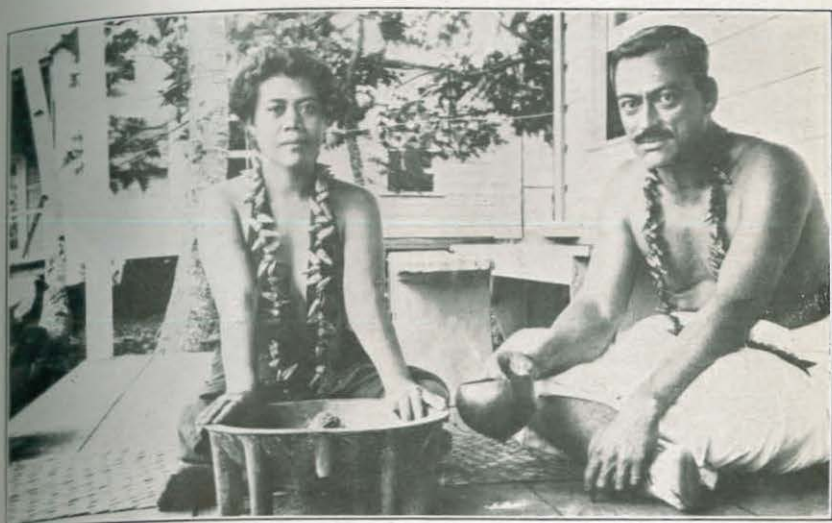


slow for the American bibber, he has substituted a meat grinder for the mortar and pestle and makes the infusion or mixture by macerating a muslin bag of the root in a bucket of water until it has the proper color and flavor. It is a cooling and refreshing drink and has an agreeable spicy taste to one accustomed to it. Nonmedical writers have credited kava with causing many diseases, among them leprosy. The natives told me that long continued kava drinking is the cause of a peculiar thickened and wrinkled condition of the skin seen in many of the old Samoan men; they also say that its constant use causes loss of vigor and its use by the young natives is prohibited. Consumed in large quantities it will cause a temporary paralysis of the limbs and it seems to make one not accustomed to its use more talkative than ordinarily, but the faculties are retained regardless of the amount taken. With all due respect to the United States Dispensatory, which describes the drug as an intoxicant, and which states that "the intoxication is wholly unlike that caused by alcohol, being of a silent drowsy character accompanied by incoherent dreams", I have never experienced nor seen any one else who had experienced any hallucinations or dreams that could be attributed to the use of kava.

The palolo (*palolo viridis*) is a sea worm, and of all Samoan delicacies is the most highly prized. This strange worm is found in the vicinity of only a few of the south sea islands and then only on two or three nights of the entire year. The night the October moon changes to the third quarter is the first night of palolo's appearance; he comes next when the November moon quarters. On palolo night the islanders fill every available boat and with lighted torches paddle out over the coral reef and wait for the moon to rise. When the moon rises the sea is seen to be alive with long wriggling green and brown worms resembling caterpillars in appearance but only as thick as a piece of white line and often a yard or more in length. Nets are dipped in the water and the worms scooped up by the gallon if the night is favorable. The palolo is said to live in the interstices of the coral reef, coming to the surface to spawn only on the nights of the quartering of the October and November moons. At any rate he is not to be found at any other time of the year. Some of the worms are eaten by the natives as they wiggle but the bulk of the catch is reserved for the big feast the following day. They are wrapped in banana leaves and baked, and anyone who has ever eaten palolo will never question the Epicurean tastes of the natives. The flavor reminds one faintly of the lobster or other sea food but is finer than either the lobster or oyster.

My first palolo night was spent in Manua and as the worm and the means of catching him were then unknown to me I was puzzled at the large number of requests for the renewal of dressings on the part





MAKING KAVA.



SAMOAN WORKING PARTY.



ELEPHANTIASIS OF THE ARMS.



SAMOAN VILLAGE.



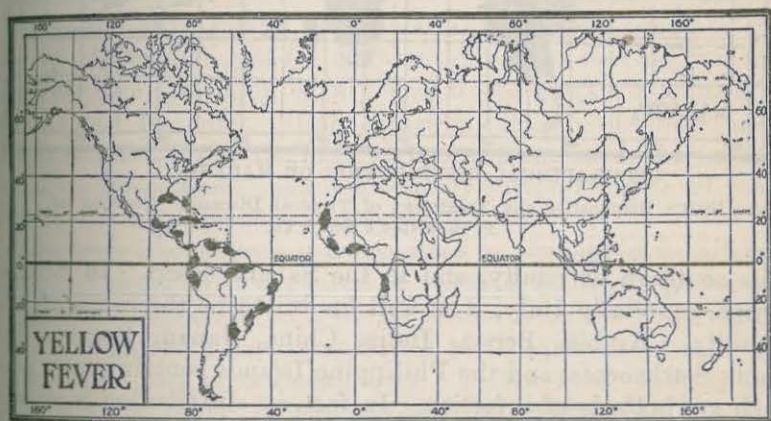
of my patients for two or three days before palolo. The mystery was cleared on palolo night when I saw my patients minus their dressings but carrying hand nets made of pieces of gauze sewn together. Needless to say I refused all gifts of palolo, preferring to catch my supply in a net of my own making.

After having spent over two years in Samoa, a year and a half of which time the natives were my only neighbors and companions I wish to say that for generosity, hospitality, and never-failing good humor the Samoan is not equaled. There are no paupers and the poorest native is as rich as his brother if he claims the rights of relationship. After observing the happy care-free existence of the natives in their daily home life one often wonders what civilization has added to the happiness of the world.

## GEOGRAPHICAL DISTRIBUTION OF MALARIA AND YELLOW FEVER.

By CARROLL FOX, Surgeon, U. S. P. H. S.

Malaria is a disease which has been recognized for many years, and which is found in many parts of the world. In some communities it is so prevalent and fatal that practically an entire



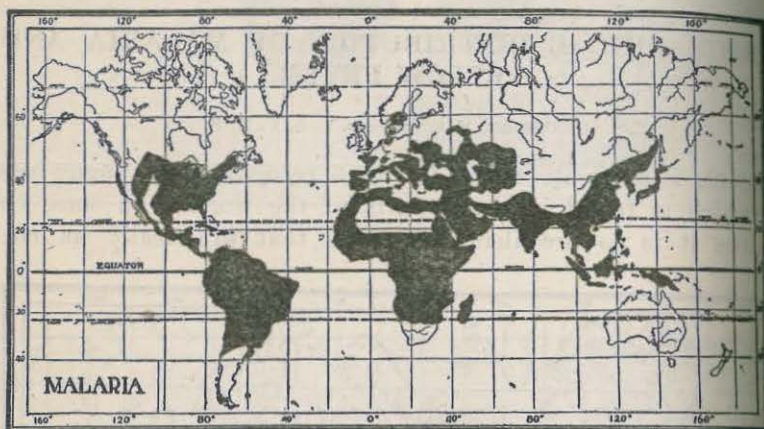
GEOGRAPHICAL DISTRIBUTION OF YELLOW FEVER.

From Stitt's *Diagnostics and Treatment of Tropical Diseases*. Courtesy of P. Blakiston's Son & Co.

population may be infected causing the growth of the community to remain stationary or even to retrograde. It is not always an acute condition; some forms tend to become chronic, making the individual a confirmed invalid unable to earn a living and finally ending in death.



Much of the malaria in the Navy originates in the personnel stationed abroad in malarial districts or in ships which have visited foreign ports where malaria is prevalent. This was to a large extent the cause for admission to the sick list of 2,045 cases of malaria in the Navy during the year 1917. It must not be thought, however, that malaria is always an imported disease, for there is much of it in the United States. In fact, its distribution in the United States is widespread. There are many places in the interior, as well as along the coasts, from Maine to Florida and from Florida to Texas, as well as in California, which are notoriously malarial centers. It is also distributed throughout South America, except in southern portions, and it is common in Mexico, except in the higher altitudes. In Central America, in Cuba, and the other islands in that general geographical location. It is widely distributed in Africa, except



GEOGRAPHICAL DISTRIBUTION OF MALARIA.

From Stitt's *Diagnostics and Treatment of Tropical Diseases*. Courtesy of P. Blakiston's Son & Co.

at its southern extremity, and in the Sahara desert. In Southern Europe, especially Italy, it is well known to be the cause of much disability. Arabia, Persia, India, China, Japan, Borneo, Java, Straits Settlements, and the Philippine Islands contain many places which are hotbeds of infection. In fact, its distribution is so widespread that an enumeration of all of the places where malarial infection is present would make a long list. In general, it may be said to exist throughout the tropical zone and most of the North and South Temperate Zones. Malaria is one of those diseases which are carried by an insect, the mosquito. There are at least four kinds of mosquitoes which may transmit malaria. All of them belong to that family of mosquitoes known as the anophelines.

Without a suitable mosquito the disease can not spread. A part of the life of the malarial organism is spent in the body of the

insect. When a mosquito bites a patient suffering with malaria the organism in the patient's blood passes into the stomach, pierces the stomach walls, and finally enters the salivary glands. It is then inoculated with the mosquito's saliva into the blood of another person at a subsequent biting.

When we speak of the geographical distribution of malaria we really mean the geographical distribution of the malarial mosquito. It is quite clear that men stationed in malarial districts or who are in vessels visiting malarial ports should protect themselves against the bite of the malarial mosquito. Ordinarily this insect only bites at night and therefore protection is needed more especially at night, through the use of mosquito bars or the screening of houses, and the avoidance of going ashore after dark. There is also a drug which is known to be poisonous to the parasite, namely, quinine. This drug is used not only to treat patients suffering with malaria but it may also be used as a prophylactic, in that, if quinine is circulating in the blood in sufficient strength, malarial parasites which may be introduced by a mosquito are immediately killed before they can undergo development. For this purpose five grains of quinine may be taken once a day. It has already been said that in the absence of the malarial mosquito malaria can not be spread. It is logical therefore in the prevention of malaria to eradicate all places where malarial mosquitoes may breed. It has been pointed out in another number of the SUPPLEMENT that malarial mosquitoes breed in still bodies of water, like ponds, marshes and slow moving streams, especially where protection is furnished to the larval mosquitoes by water plants. Draining, filling, clearing, etc., are problems ordinarily to be taken up by the local authorities, but much can be done to eliminate mosquitoes in and immediately surrounding naval reservations by the naval personnel attached thereto.

Yellow fever like malaria is transmitted by the bite of an infected mosquito. The causative organism of yellow fever is not known and it is therefore impossible to trace its course from the blood of the patient through the mosquito and back to a healthy person, as can be done in the case of malarial fever. Yellow fever is always an acute disease and never becomes chronic. Its geographical distribution is much more limited than that of malaria. The species of mosquito which carries yellow fever is entirely different in appearance from that which carries malaria. In general, the yellow fever mosquito to thrive needs a warm climate and a low altitude. It is usually found between 38° north latitude and 38° south latitude. The yellow fever mosquito is also distinctly a domestic mosquito, in that it breeds in and around houses, in rain barrels, cisterns, roof gutters, old tin cans and the like. Yellow fever can not spread ex-



cept in the presence of yellow fever mosquitoes, nor is it possible for the mosquito to become infected until it has bitten a person suffering from yellow fever. At present the endemic centers of the disease are chiefly the islands and coast of the Gulf of Mexico and the West Coast of Africa. It is also present in parts of the west coast of South America, at times appears in Central America and Brazil, and has visited the United States and Europe. It is unknown in Asia. In the Philippine Islands and Hawaii there is a mosquito so closely related to the common yellow fever mosquito that without a doubt the disease would be able to spread in those islands if it should once be introduced.

## AN ENTOMOLOGICAL SURVEY OF THE UNITED STATES NAVAL TRAINING STATION, NORFOLK, VA.

By J. W. BAILEY, H. A. 2c., U. S. N. R. F.

Bearing in mind that "An ounce of prevention is worth a pound of cure" we should be in a position to recognize at once the importance of preventive medicine and accept it at face value. In view



Egg of yellow fever mosquito.  
(Much enlarged.)

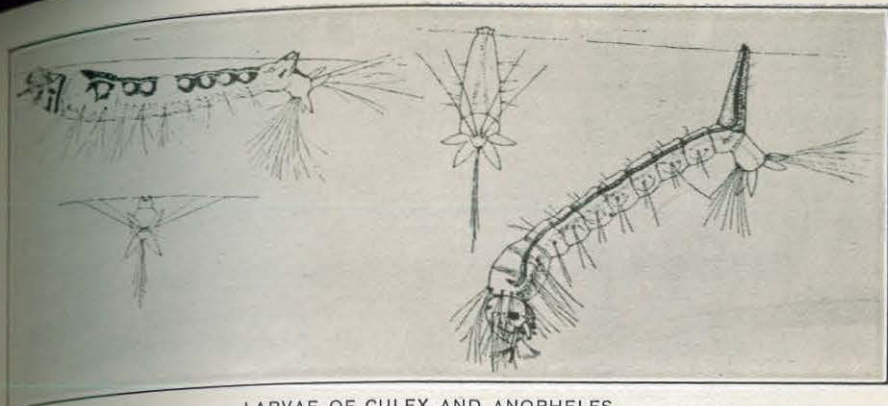
of the fact that entomology bears a twofold relationship to health it may be of interest to note, before entering upon a discussion of either, the difference between the two phases, agricultural entomology

and medical entomology. Agricultural entomology deals primarily with insects affecting our food supplies—the very food upon which human and animal health are contingent. Medical entomology has to do with the study of insects affecting the health of man and animals.

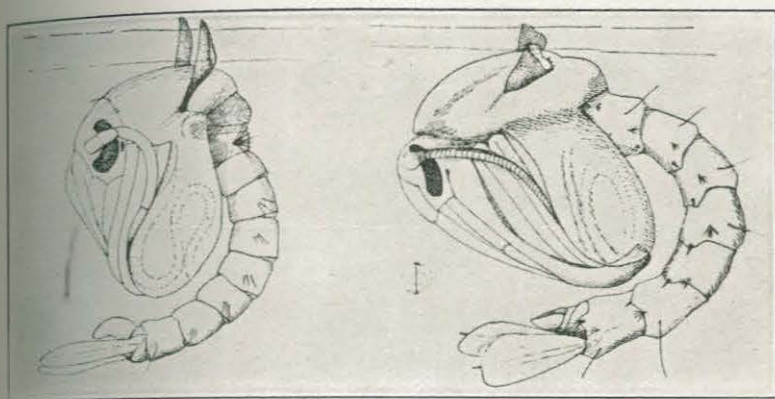
To-day many entomologists are turning their attention to the military side of the question, studying the life history of the insects which cause disease among troops, including, of course, all naval forces; and the best and most practicable methods of preventing disease caused by insects. We are, however, not overlooking the importance of problems affecting our civilian population, national, municipal, and domestic.

Briefly it may be stated that insects affect the health of man and animals in two ways; by causing disease and by carrying disease. Early medical authorities assumed that the disease was actually *caused* directly by insects and did not take into account the possibility of *transmission* by insects.

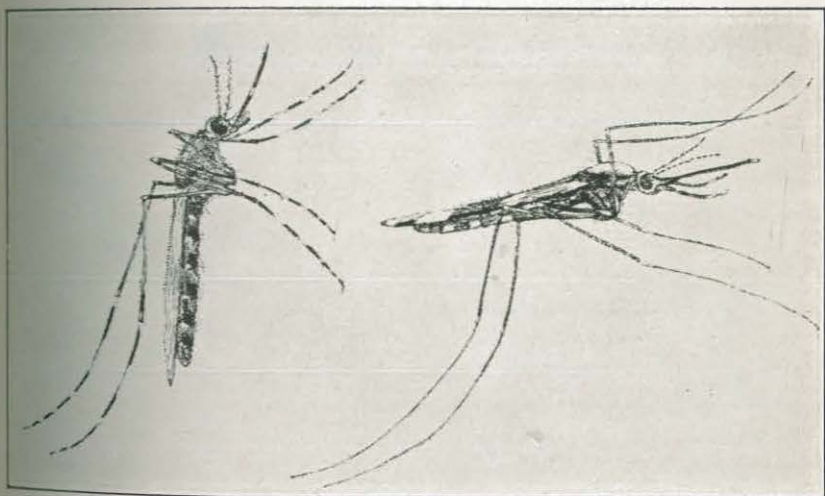
Diseases caused directly by insects may be conveniently grouped under the following heads: Entomophobia, paralysis, poisoning, accidental injury to sense organs, annoyance and worry, dermatosis



LARVAE OF CULEX AND ANOPHELES.

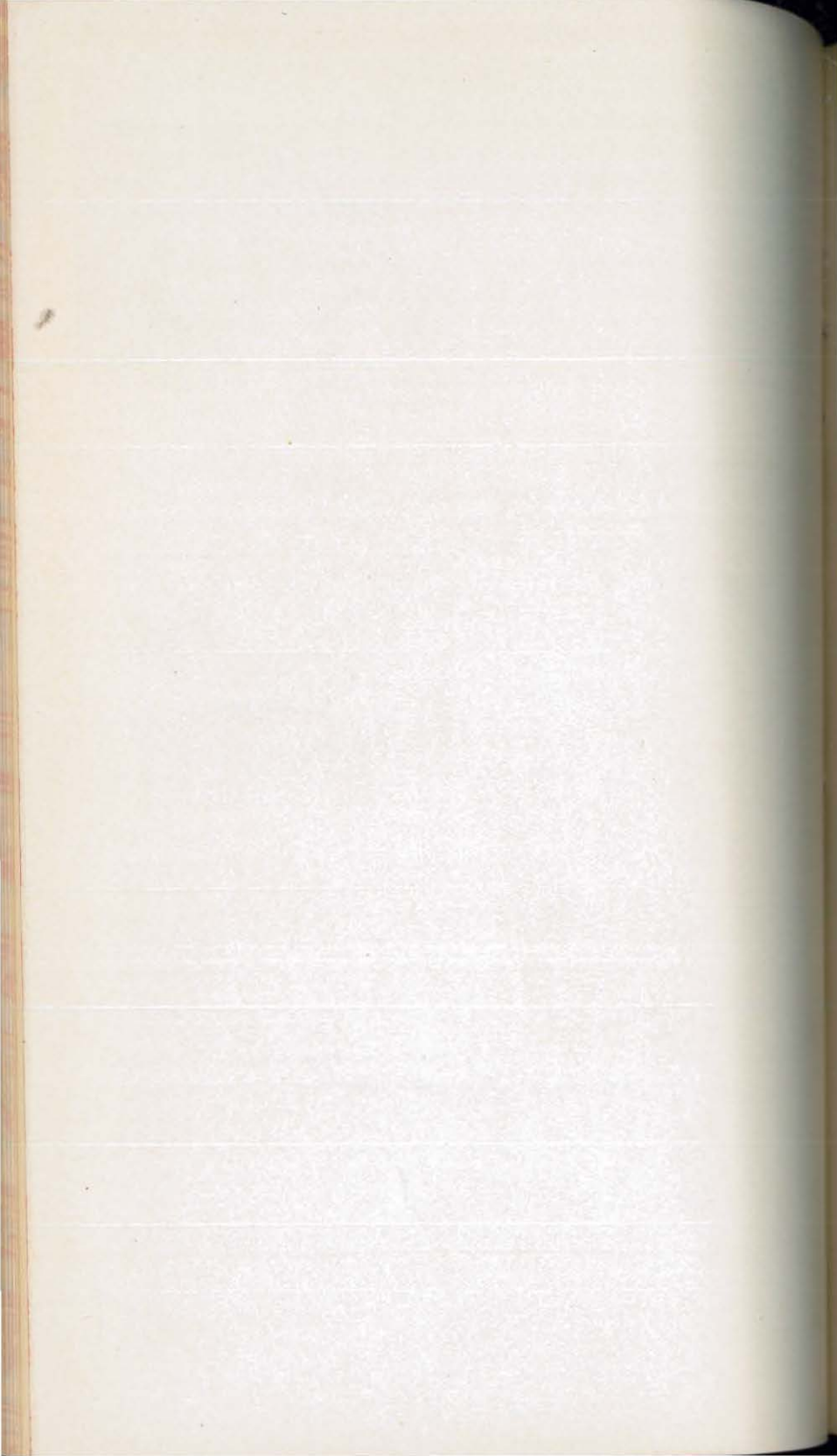


PUPA OF CULEX AND ANOPHELES.



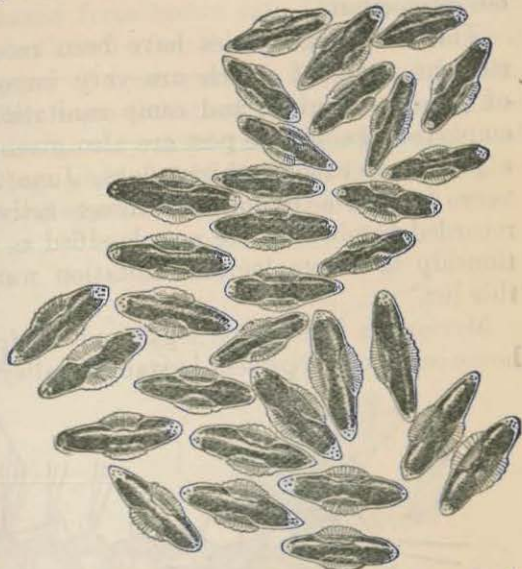
CULEX AND ANOPHELES, RESTING,





and myiasis. The latter may be either of two types—dermal myiasis or internal myiasis.

Indirectly insects play even a more important rôle in the lives of man and animals than by direct methods. This indirect method may vary according to the habits of the insect, the host, and the causative organism. The carriage of disease to food and wounds may be mechanical or biological, depending upon the nature of the disease. The transmission of the typhoid bacillus from excreta to food by the house fly affords an excellent example of mechanical carriage, while recent discoveries by Davies, Weldon, Bruce, Lambert, Strong, and others (1917 and 1918) in regard to the transmission of trench fever by the louse, *Pediculus humanus*, offer convincing proof of the biological carriage of disease by insects. Although also indirectly responsible, many of our most dreaded diseases gain access to the human body by direct attacks of insects.



*Anopheles quadrimaculatus* eggs. (Highly magnified.)



Papa: Yellow fever mosquito. (Much enlarged.)

These attacks give rise to disease either by direct or indirect inoculations. Direct inoculations are very numerous and we need refer only to malaria and yellow fever transmitted by anopheles and stegomyia mosquitoes, respectively, and to Rocky Mountain spotted fever virus inoculated by *Dermacentor vernustus* and bubonic plague inoculated by rats. Fleas are also good examples of

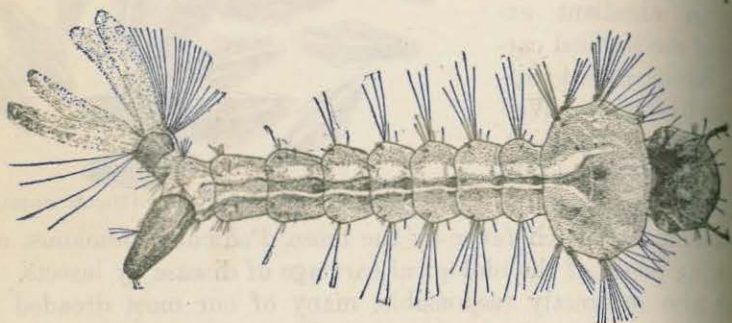
direct inoculation by insects. The organism causing African relapsing fever offers an example of indirect inoculation. This organism is washed into the puncture caused by the feeding of the tick, *Ornithodoros moubata*, by means of a coxal fluid.



The foregoing statements concerning the methods by which insects can cause or carry disease are given in order that the species mentioned in the attached report may be regarded as intruders in naval camps and treated accordingly. They should not receive our protection.

The following species have been recorded at one of our naval stations, some of which are very important from the standpoint of personal hygiene and camp sanitation. The remedial measures employed against the pest are also given. These observations cover a period of exactly thirty days, June 26 to July 25, inclusive, a very favorable period for insect activities. A few species are recorded herein that are not classified as insects but their close relationship to entomological sanitation warrants their presence upon this list.

Myriapoda "Thousand legs" and centipedes: *Scutigera* forceps or house centipede is present in stables, galleys, and mess halls. It preys



Larva: Yellow fever mosquito. (Much enlarged.)

upon house flies, and hence is beneficial. Thanks to its frightful appearance it is usually killed at first sight by those who do not realize its value to mankind.

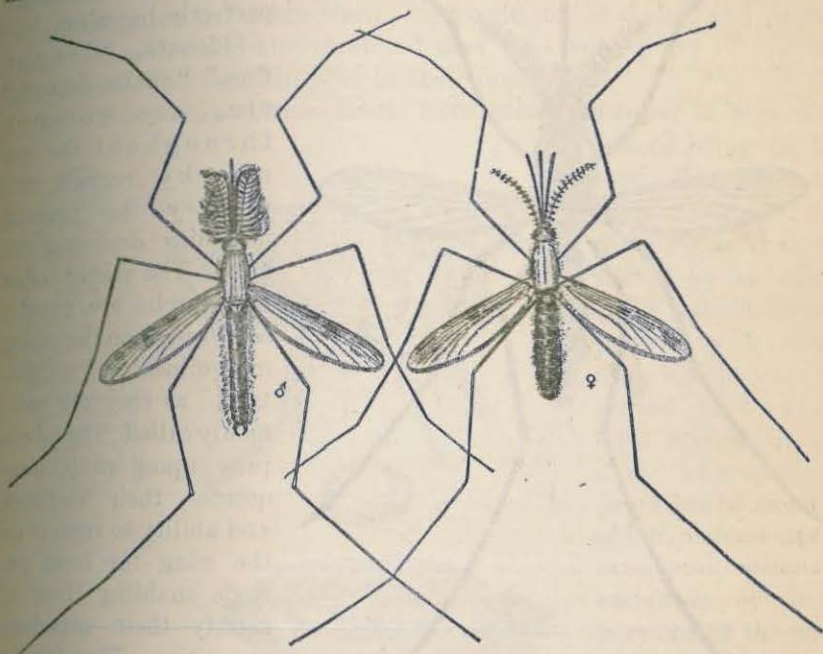
Scolopendra and *Julus* species are present about stables and beneath moist drift wood along waters' edge and in dump piles. They are of no consequence, though often accused of entering the ear of man causing trouble to that organ. There are however larger species found in the southwest that cause serious complications by poisoning. Practically all centipedes possess a small poison sac on the first pair of legs but the ones encountered in the vicinity could not be said to poison a human being.

Arachnida, spiders: *Lactrodictus mactans* has been collected on several occasions. It is capable of producing somewhat serious symptoms, but is not fatal in man.

Acarina, mites and ticks: *Trombidium irritans*, "red-bug." specimen was taken from a patient on June 26, by Dr. H. Krummes.

*Dermanyssus gallinae*, chicken mite. A few specimens were collected from poultry in camp near negro quarters on July 6. Comparatively few specimens are present on poultry at this station.

Ixodidae, ticks. Several specimens of a small tick, probably the genus *Argas*, were collected from brown rats (*Mus norvegicus*) on July 10. The rats were collected after the distribution of arsenic applied to the internal organs of fresh poultry distributed in rubbish on the dump pile. They were examined as soon as found and only those which had been dead a very short time yielded specimens of the tick. Rats caught by dogs yielded fleas as noted later, probably due to the fact that the blood was still warm at the time of examination. Insecta, insects.



*Anopheles quadrimaculatus*; male and female mosquito.

Thysanura, spring tails. These are common along the waters' edge under drift wood and in moist places. They are known as "spring tails" on account of the peculiar spring-like apparatus attached to the posterior end of the abdomen folding beneath the body. When released this structure strikes the surface and gives the insect a spring forward.

Specimens of the genus *Podura* have been noted. They are of no consequence in the study of medical entomology unless their presence is used as an indicator of low moist locations, suggestive of possible mosquito breeding places. Some species of course are known to pre-



fer dry surroundings but generally speaking they are inhabitants of damp places.

Thysanoptera, thrips. They are found in practically all flowering plants, and very abundant in the flower gardens on the station. They are nonpoisonous but sometimes, when one is enjoying the fragrance of flowers, they are inhaled, giving rise to irritation of the mucous membrane of the nasal cavities.

Euplexoptera, earwigs. These are thought to enter the ears of man, hence the name. They are present in small numbers throughout



The yellow fever mosquito (*Aedes calopus*), adult female.

the camp and feared by most of the men who encounter them, though perfectly harmless.

Odonata, "dragon flies," "snake doctors," etc., are common throughout the low marshy regions and probably the greatest mosquito destroyer we have. The young forms or nymphs are aquatic and feed upon the young mosquitoes or "wiggly tails," as they are commonly called. The adults prey upon adult mosquitoes, their alertness and ability to remain on the wing for long periods enabling them to satisfy their voracious appetites. The family Libellulidae is represented by several species

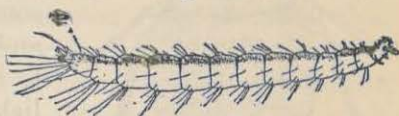
at this station, *Libellula pulchella* predominating. Their presence should be encouraged and no person aware of their usefulness to man desires to see them destroyed.

Orthoptera, roaches: Members of this order are believed to be responsible to a certain degree for the conveyance of tuberculosis, diphtheria, typhoid fever, tonsillitis and in all probability other diseases. They must be regarded as a sanitary menace. Roaches are nocturnal in their habits and we may never realize the extremely large numbers present until we make a visit to the pantry, galley or mess hall during the early hours of the night. The eggs are deposited

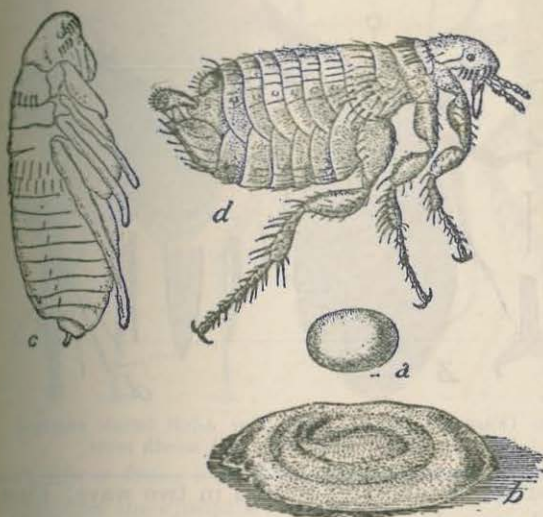
in some dark hidden place such as the under side of the shelf, table or chair. They resemble a dark brown capsule and each of these little horny capsules contains several dozen eggs which hatch into small nymphs resembling the adults except for the lack of wings. There is only one generation per year.

The most common species found in this country are conspicuous on account of their large size and abundance. *Periplaneta americana* and *Blatta germanica* have been collected in large numbers about the storerooms, galleys, mess halls and, in some instances, in sleeping quarters. In the latter case nearly every bungalow or "bunk room" that contributed shelter and protection to these insects also sheltered men who were guilty of keeping bread and other food supplies in their possession.

In a few instances complaints have been registered in regard to



Larva of European rat flea.



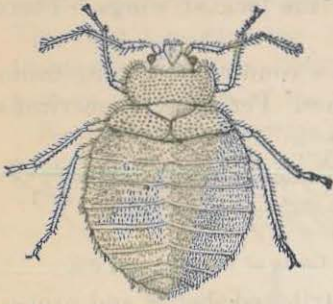
The dog flea: (a) Egg; (b) larva in cocoon; (c) pupa; (d) adult.

insects being in the food. The latest authentic record of this nature is that reported by an officer at the station, accompanied by a specimen which was reported as having been served in the soup. This specimen proved to be an adult of *Periplaneta americana* and, with the exception of distal portions of the wing and antennæ, it was in splendid condition.

Both of the above-mentioned species have no trouble in finding their way into the fly traps, which are distributed throughout the station, and it may be said that these traps might safely be termed "roach traps." *Blatta germanica* outnumbers our native species and is much smaller, consequently catches of this species are in the majority. Many specimens have been caught on "tanglefoot" which was put out for flies. An insect powder furnished by the equipment yeoman has given satisfactory results. This powder is composed mostly of sodium fluoride, the recognized prescription for the extermination of these pests. Imperfections in the structure of buildings



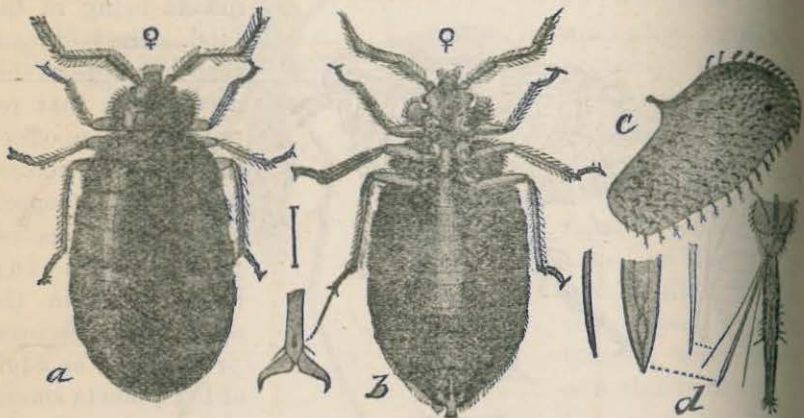
such as cracks, crevices and unnecessary corners accompanied by warm temperature and negligence on the part of the mess attendants are responsible for the majority of the roaches within the



Bed bug: Adult, before engorgement.

bounds of this station. The most palatial roach apartment within this vicinity is to be found in the mess hall of the receiving ship. Live steam proved of some value when applied to the cracks and crevices, but such treatment is apt to leave the woodwork moist and more liable to rapid decay than under normal conditions. It also makes it ideal for those that are left.

Siphonaptera, fleas. The cat flea, *Ctenocephalus felis*; the dog flea, *Ctenocephalus canis*; and the rat flea, *Ceratophyllus fasciata*, have been collected at this station.



Bed bug (*Cimex lectularius*) (Farmers' Bulletin 754): (a) Adult female engorged with blood; (b) same; (c) rudimentary wing part; (d) mouth parts.

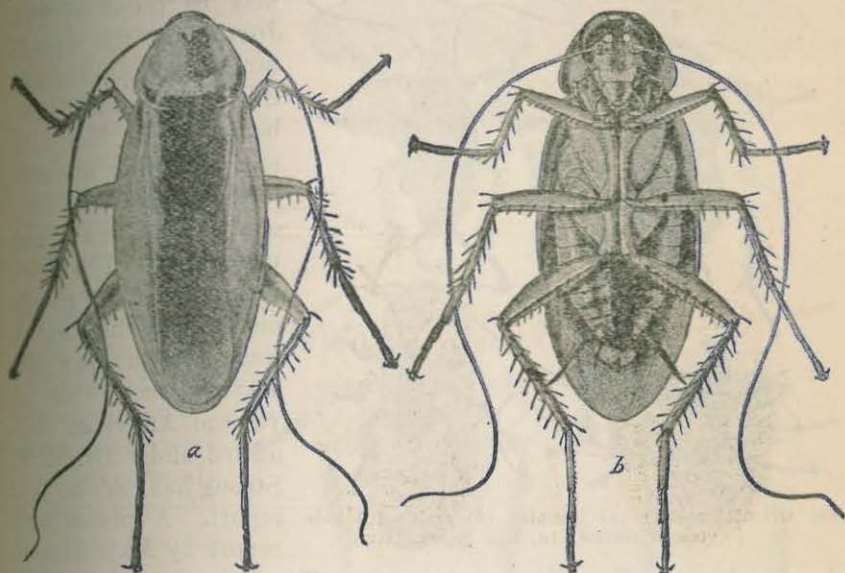
Members of this order affect man and animal in two ways: First as disease carriers, and second as parasites and annoyances. Although no specimen of the human flea has been noted here, the group may be regarded as very important in so much as rats infested with fleas are plentiful, especially in the dump piles where refuse of nearly all types has been deposited.

Knowing that the dreaded bubonic plague is transmitted by fleas, it will be of interest to note briefly the life history of these insects. Fleas feed upon the blood of their host and fertilized females as a rule deposit their eggs while on the host. These eggs are not



Egg capsule of American roach: (a) Side view; (b) end view; (c) natural size.

fastened to the hairs in any way, consequently when the host moves around the eggs are shaken off, usually to the floor or nest, as the case may be. The eggs are whitish or cream colored, being ovate in shape. They hatch within two to twelve days, depending upon the species as well as the temperature and humidity. The larva emerging from the egg is not parasitic, but lies in a crack, crevice or fold of cloth and feeds upon the debris that may be found. This food may consist of vegetable matter or excrement from the adult flea. After feeding for a period of from four days to several months, a tiny silken cocoon is spun in which the immature flea may remain from three days to more than a year. The duration of an adult



The American roach.

flea's life is from a day to almost a year, depending upon the food supply and the climatic conditions.

House infestation may be relieved to some extent by sprinkling naphthalene (flaked) on the floors and closing the doors to the rooms for a few hours. Larvæ may be killed by applying water. Sulphur fumes, kerosene and cyanide are also used. Chloroform may be used on the person when infested with fleas.

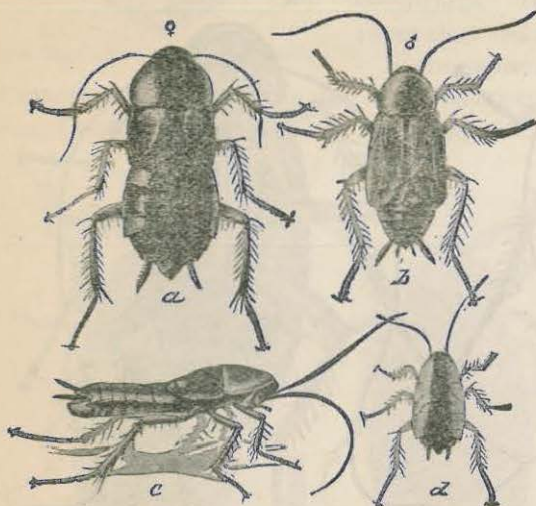
Hemiptera Parasitica, Pediculidæ, lice.

*Phthirus pubis*, the "crab louse" of man, has upon many occasions been noted upon the men in camp. Various remedies have been resorted to, among which are the following: Mercurial ointment, calomel, kerosene, turpentine, and shaving of the pubic and anal regions.



Careful search for *Pediculus capitis* and *P. irritans* (vestimentorum) yielded negative results.

Members of this family are very important and at present are playing an important rôle in the great war in which we are engaged. Besides being the transmitters of typhus fever and possibly of relapsing fever, lice have been conclusively proved to be the transmitters of trench fever. The carriage of this disease is strictly biological, the causative organism being carried by the louse, *Pediculus humanus* (vestimentorum), in its excrement. The agent enters the body by being scratched into the flesh in louse excrement or bodies. An interesting account of the work done on this subject



The Oriental roach: (a) Female; (b) male; (c) side view of female; (d) half grown.

may be found in The Journal of the American Medical Association, in the following numbers: Vol. 71, Nos. 1, 2, and 3. Other accounts have appeared in various periodicals and newspapers. The above reference is to results obtained by the English committee under Sir David Bruce, while as yet the American committee under Dr. R. P. Strong has made no final report. A preliminary report by Maj. Alexander Lambert, of New York, appeared in The Journal of the American Medical Association, Vol. 70, No. 26.

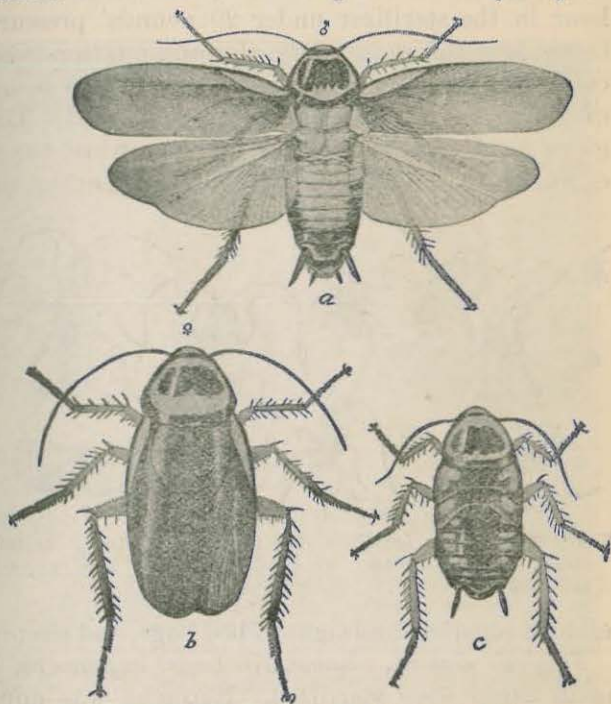
Acanthiidae, "bed bugs," *Cimex lectularius*, is the possible carrier of many communicable diseases, such as tuberculosis, leprosy, relapsing fever, and even "Kala azar," a tropical disease characterized by anemia and enlargement of the spleen. They have been collected in all stages and preserved in 70 per cent alcohol.

The life history of the bed bug is as follows: The female deposits from 50 to 200 eggs per year. These eggs are deposited in cracks and crevices, more especially about the bed but sometimes in foot lockers, boxes, and on the underside of tables, chairs, and benches. The eggs hatch in about 10 days, when conditions are favorable, and the resulting nymphs begin to feed upon blood. Bed bugs are especially resistant to heat, cold, and gaseous fumigants,

This species offers undoubtedly the most perplexing sanitary problem of this camp, and its continued presence can be attributed to three principal sources, namely: The constant stream of men pouring in and out from and to all parts of the world, carrying their bedding and effects; negligence on the part of the men after arriving in camp, especially those who remain for any length of time; the peculiar structure of the buildings and sleeping quarters, none of which can be made tight enough for fumigation. A few lines will be devoted to each of the above delinquencies.

The men are permitted to enter or leave camp without any inspection of their effects whatsoever; consequently infestation of this camp by newcomers or the infestation of ships and camps to which our men go is permitted, even unconsciously encouraged. A large disinfecting plant and an enthusiastic inspector who thoroughly understood the work would certainly check if not wholly eliminate this defect.

Secondly, a large number of the men having their sleeping quarters infested with this species have no ill feeling whatsoever toward the intruders and, in fact, some have asserted that they much prefer furnishing blood for the bed bugs every night to being bothered once by the sanitary squad. This is especially true of the men who employ cots to sleep on and have volunteered to isolate themselves in some little corner or "den." The men sleeping in the open bungalows are rarely if ever troubled by bed bugs, except as mentioned above, those sleeping on cots and having accumulated a box or locker in which their clothing is kept. This box affords a hiding place for the bugs during the daytime.



The Australian roach: (a) Male; (b) female; (c) pupa.



Last but not least we have the problem of exterminating these pests after they once get established. Under the present housing conditions extermination is nearly impossible, due to the fact that 99 per cent of the buildings at this station can not be made air-tight for gaseous disinfectants. Other disinfectants are not thorough.

Control methods as employed during the present campaign against bed bugs may be noted in the following paragraphs:

On July 15, there were removed to the sterilizer at the "sick bay" 57 cots, pairs of blankets, mattresses and numerous other articles of clothing from the instructors' quarters. They were exposed for one hour in the sterilizer under 20 pounds' pressure. While this was being done the walls of the sleeping quarters were given a thorough coating of kerosene, the cracks and crevices being reached by means of a fine spray and feathers dipped in oil. The lockers were also given a thorough coating of kerosene while the floors were swabbed down with crude oil. Upon removal from the sterilizer the bedding



The German roach: (a) First stage; (b) second stage; (c) third stage; (d) fourth stage; (e) adult; (f) female with egg case; (g) adult.

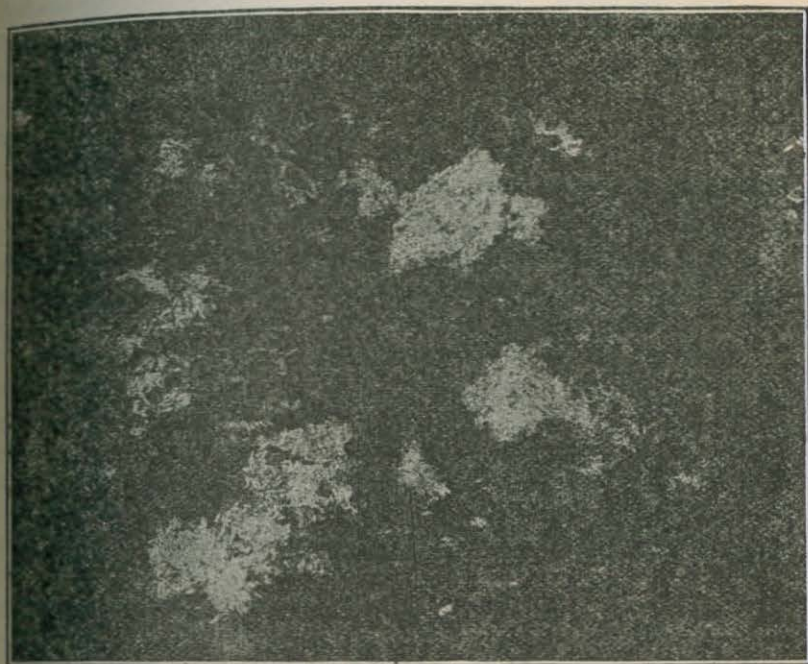
was aired thoroughly by exposing to the sunlight for a couple of hours. Inspections to determine the thoroughness of the application were made on July 16, 17, 18, and 23. Upon each inspection

all men reported "no signs of bed bugs, and sleeping well each night."

July 20 and 21. Some 378 bags, hammocks, bedding, etc., from main camp were sterilized. Kerosene was applied to cracks and crevices of walls, tables, seats, and boxes and the floors were swabbed with crude oil as described above. The bungalows harbored very few specimens, due probably to the fact that few cots were used and only a limited number of men possessed lockers in which the bugs could conceal themselves. Another very important factor that should be considered in connection with the comparative freeness of the bungalows from infestation is the temperature. Undoubtedly the temperature of these bungalows must drop to such a low degree that the bed bugs can not survive the cold months of the winter season. Further inspections showed treatment to be very effective.

July 25. Ten cots, mattresses, pairs of blankets, etc., from Camp Lawrence galley force sleeping quarters were sterilized, while

the "bunk room" was given an exceedingly thorough application of kerosene. It was necessary to remove a quantity of burlap from the overhead of this room before applying the kerosene. This cloth was tacked midway between the floor and the roof in order to form a low ceiling. Within the folds and trucks many specimens were found. This material, as well as vast quantities of other unnecessary fabric, were removed to the incinerator and burned. All lockers were sprayed with kerosene, and the entire contents of the room were exposed to the sunlight for several hours after disinfection.



Eggs of the house fly.

The sleeping quarters adjoining the shoe shop were also found to be infested, but the constant attacks on these pests by members of the household have almost exterminated them.

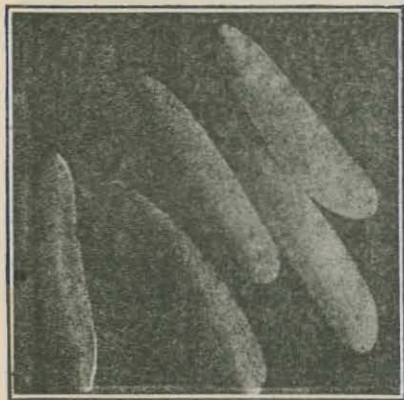
The Detention Camp, Camp Perry, and Camp Farragut, are free from these pests, while a few specimens were recorded in the cot and mattress room of the commissary building just beneath the band barracks. Practically all of these cots have been issued, and no doubt many of the bugs accompanied them; possibly to some or all of the above-mentioned camps.



Complaints from officers of the medical department, who sleep aboard the *Cumberland* and *Richmond*, tend to confirm the belief of the writer that both vessels are infested with this species. Bites on the bodies of two assistant surgeons showed the swelling and disagreeable inflammation, surrounding the point of puncture, peculiar to the bite of the bedbug. An opportunity to visit these vessels has thus far not presented itself. (See further notes, July 29.)

July 29. Further notes on *Cimex lectularius*. Inspection of the U. S. S. *Cumberland* and the U. S. S. *Richmond* confirmed the writer's belief that this species was aboard the above mentioned vessels. Specimens were collected and preserved in 70 per cent alcohol. All stages were present. Bedding and cots were sterilized, while kerosene was applied to the bedsteads. Numerous specimens were encountered and given a thorough covering of oil. Only a portion of the U. S. S. *Richmond* has been treated so far, but the remainder

will be treated as soon as possible.



Eggs of house fly highly magnified.

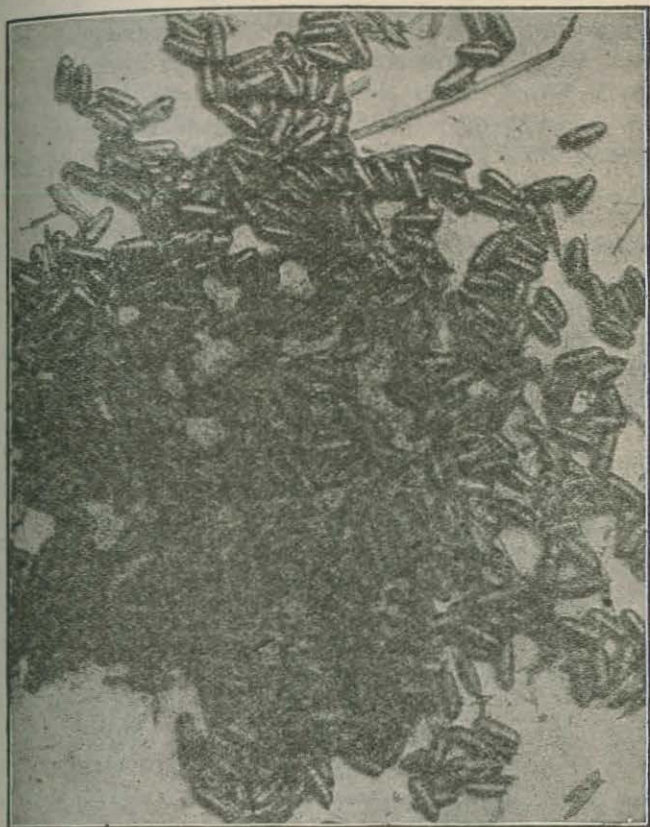
Diptera, flies, and mosquitoes. Before taking up the local fly fauna a few words concerning the relationship of flies to disease may be of interest. The house fly carries germs and organisms on its body, thus causing infection by contamination. The stable fly pierces and sucks blood, as does the tsetse fly. Some species cause disease, such as myiasis, by entering the digestive system with the food, entering the flesh by means of open wounds, and by the young

being deposited within the nostrils, ears, or vagina. The most important disease that is credited to the typhoid fly is typhoid fever, from whence it receives its name. Flies are capable of transmitting many other diseases among which may be noted Asiatic cholera, dysentery, infantile diarrhea, tuberculosis, anthrax, yaws, ophthalmia, smallpox, tropical sore, and many parasitic worms.

Briefly, the life cycle of the typhoid fly is as follows: Egg stage in manure or decaying organic matter, one to three days; larvae feed within this substance from 4 to 6 days, while the pupæ require from 3 to 6 days in the loose soil near the surface. The adult may hibernate over winter in the extreme southern States.

The following species of flies have been recorded at this station and no doubt there are many others to be added to the list: The typhoid fly, *Musca domestica*; the stable fly, *Stomoxys calcitrans*;

the bluebottle fly, *Lucilia caesar*; the small house fly, *Fannia* species; the dung fly, *Sepsis violacea*; the fruit fly, *Drosophila* species; the



Pupæ of the house fly.

horse fly, *Tabanus* species; the black fly, *Simulium* species; the syrphus fly, *Eristalis* species; the crane fly, *Tipula* species and several species of robber flies.

In carrying on the campaign against flies it has been necessary to resort to measures other than those of prevention, due to the fact that the campaign was begun after two or three generations of flies had emerged and the camp was overrun with them. Preventive measures were also started at once in order that the number present should not increase.

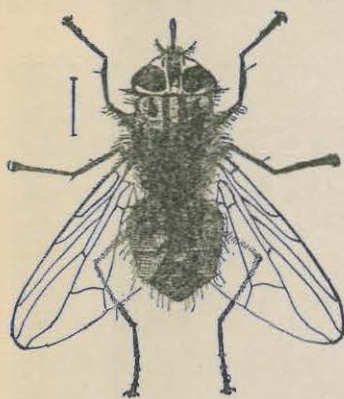
At the beginning of the survey many eggs, larvæ, and pupæ were found in the manure bin kept just outside of the stable near the negro quarters. Two horses are kept in this



House fly (*Musca domestica*).



stable, and it is constructed in such a manner that fly breeding is invited. The floor is of wood, punctured by holes bored through for the purpose of allowing urine and "washings" to escape beneath the stable, which sits from 6 to 18 inches above the ground. An investigation disclosed the fact that liquid manure had accumulated beneath the floor sufficient to harbor many thousand larvæ. After washing down the stable on the morning of June 24 puparia of the house fly were found exposed to the sunlight in a shallow trench leading to the river. These pupæ cases were collected, carried to the office of the surgeon, and on the morning of June 26 the adult *Musca domestica* emerged in large numbers. It was on this date that the inauguration of the sanitary squad took place. The sanitary squad consisted of the writer. Later J. D. King, apprentice seaman, was detailed to assist in this work and remained for two weeks. Flies



The stable fly or biting house fly  
(*Stomoxys calcitrans*).

were found breeding abundantly within 30 yards of the sick bay in the station garbage heap, as well as southwest of the detention camp galley, in discarded tea leaves and coffee grounds. Many outside breeding places have been located, some within 100 yards of the sick bay. In one instance five carloads of horse manure and straw were found switched on the sidetrack of one of the railroads within five blocks of the station bounds. On Sunday, July 14, the writer spent an hour or so watching the flies emerge from these cars and fly away. This instance was reported to

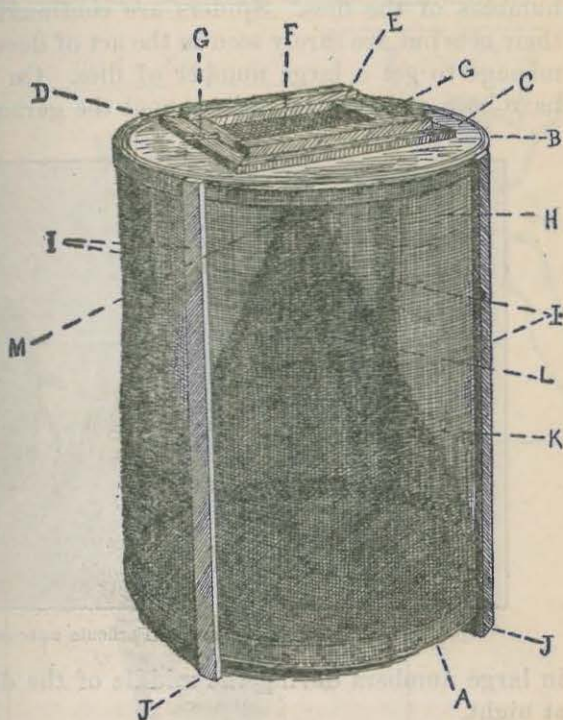
the surgeon in charge of the station. If the vicinity surrounding the training station were put under the supervision of the naval medical authorities, and not left to the city officials, there is no doubt at all that the sanitary conditions would improve perhaps 100 per cent. At present it can be safely said that no flies are breeding within the bounds of this station, although there are many specimens with us. They are intruders, bred on the outside.

The methods pursued in breaking up the fly breeding places and ridding the station of many thousands of these pests may be stated briefly as follows: The garbage dumps have been practically filled, covering all decaying matter that offered food to the larvæ. Several teams and men have been working for the past three weeks hauling and distributing cinders, sand, and soil over the dump. Such things as could not be filled or covered were burned or moved away. The horse manure is no longer stored away in a bin where flies may have access to it. It is burned. By the addition of a small quan-

tity of wood each morning the garbage received a much better incineration and was not so offensive as before. This will, however, be discussed under another heading. Several conical hoop flytraps were put into commission on July 3. They were distributed as follows: Detention Camp mess hall 3, Camp Lawrence mess hall 2, Camp Farragut mess hall 2, receiving ship mess hall 2, stable 1, garbage dump 1. These traps have been cared for daily, and whenever needed new bait was supplied. As bait, sugar and water mixed with

bread has been used exclusively, and one bait lasts about six days. Excellent catches have been made in all of the traps except the one in the stable. These traps are still on the job and if properly looked after will continue their good work. Some traps have yielded two quarts of flies per week. Fly paper has been used quite extensively and with good results. Sheets of this "tangle-foot" were placed in all of the mess halls, galleys, offices, baths, and heads on the afternoon of July 11. On July 13, twenty sheets gathered at random, after 48 hours' exposure, yielded 13,241 flies, besides a few roaches, crane flies, beetles, and a couple of butterflies. This gave an average of 662 flies per sheet, exclusive of the other insects. One thousand sheets were distributed at that time and owing to the splendid results 1,500 more sheets were very soon put out, and 12,000 sheets have been ordered for further use during the remaining fly season.

Formalin has been used in the offices to some extent, but it is not as effective as the fly paper or the traps. The screens in the mess

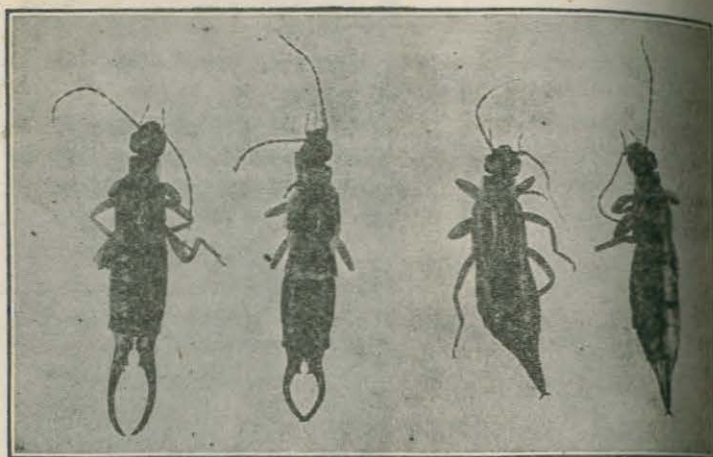


Conical flytrap, side view: (a) Hoops forming frame at bottom; (b) hoops forming frame at top; (c) top of trap, made of barrel head; (d) strips around door; (e) door frame; (f) screen on door; (g) buttons holding door; (h) screen on outside of trap; (j) strips on side of trap between hoops; (k) cone; (l) united edges of screen holding cone; (m) aperture at apex of cone.



halls and galleys have all been repaired by the carpenters, and fewer flies have been noted in these places as a result.

A natural enemy of the house fly is the house centipede (*Scutigera* *forceps*), present in small numbers and of some assistance in keeping the flies under control. Several flies have been observed with the eggs of some parasite on the thorax, probably a hymenopterous insect. As yet no signs of the fungus disease, *Empusa musca*, have appeared, but with the August heat it should appear and kill off large numbers of the flies. Spiders are continually removing flies from their nets but are rarely seen in the act of devouring their prey. They manage to get a large number of flies. On several occasions they have been observed to gather about the garbage pails and catch flies.



\* European earwig (*Forficula auncularia*).

in large numbers during the middle of the day. They usually feed at night.

Tipulidea, tipula species, crane flies. Many specimens have been collected. They are of no importance from the medical standpoint but are often mistaken for a gigantic mosquito, hence mentioned here. They are much larger than the mosquito and reddish-brown in color. The legs are very long, from which circumstance it receives its name crane fly. Crane flies do not feed upon blood.

Eristalis species are found breeding in foul water surrounding water cut-off and in gutter drains about Camp Lawrence mess hall.

Similium species. The larvæ and adults were collected in drainage ditch along the western fence border of the camp near the sick bay.

Sarcophagidae. Specimens have been collected on several occasions.

Tabanus species. Specimens have been noted many times on the wing, especially when teams were present.

Robber flies have upon several occasions been noted with their prey, other insects such as grasshoppers and large diptera.

An interesting observation was made in regard to dipterous larvæ feeding in discarded tea leaves and coffee grounds. Some of the larvæ were reared through and proved to be *Musca domestica*, but there were at least three distinct species in addition to this one.

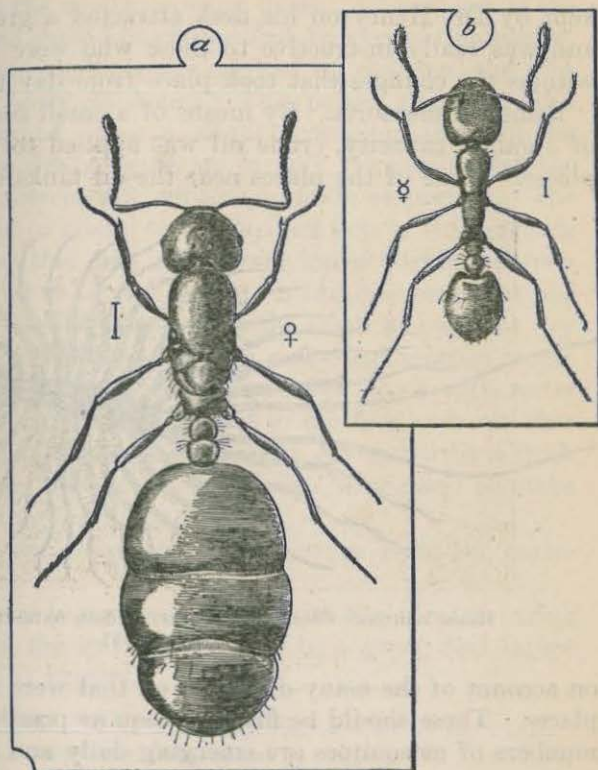
Culicidæ, mosquitoes, carriers of malaria, yellow fever, and dengue fever. Three genera have been collected, anopheles, culex, and stegomyia. Culex was very abundant at the beginning of the

survey. Mosquitoes are entirely aquatic in their premature stages. The eggs are deposited in or near water and upon hatching, which usually requires only a few days, the larvæ begin to feed and grow rapidly. The larvæ when grown become nonfeeding and are known as pupæ. This pupal stage lasts for a few days and the imago or adult mosquito appears. It is during the immature stages that mosquito control is most effective.

On July 10 the specimens collected were *Stegomyia fasciata*. They were taken from artificial containers along the western fence border of the camp.

*Anopheles quadrimaculatus*, *A. punctipennis*, and *A. crucians* were present in small numbers, but there were no breeding places within the camp limits. There was one breeding place for these species near the Portsmouth ferry, west of the station.

*Culex* species were breeding in every possible place in and around the camp. They have been taken from water-filled post holes, drainage ditches, boxes containing water meters, old cans on the



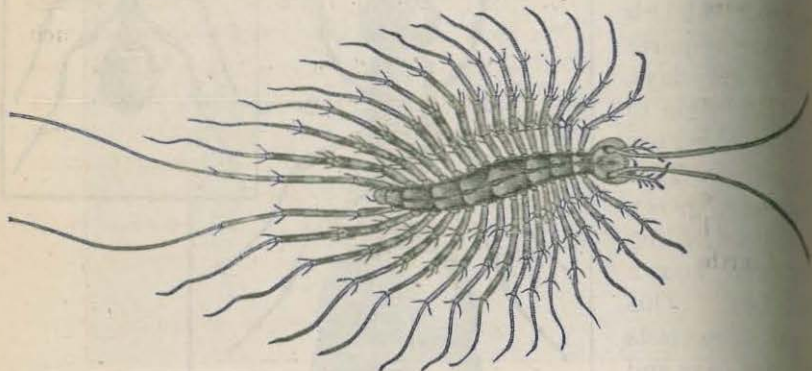
Red ant (*Monomorium pharaonis*): (a) Queen or female; (b) worker.



refuse pile, temporary puddles adjacent to the oil tanks south of the detention camp, and practically all of the inclosures protecting the steam pipes in Main Camp, Camp Lawrence, and the detention camp. In the latter they were due to the fact that the covers are rarely if ever raised and kept open long enough for these inclosures to dry out. On July 10 one single mosquito breeding place was noted beneath the barber shop in Camp Farragut.

Eggs, larvæ, and pupæ of *Culex pungens* and *Culex sollicitans* have been collected and reared through to adults. The aquarium kept by Dr. Henry on his desk attracted a great deal of attention and was really instructive to those who were fortunate enough to witness the changes that took place from day to day.

Remedial measures. By means of a small compressed-air sprayer of 3-gallon capacity, crude oil was applied to the above-mentioned places. Some of the places near the oil tanks could not be sprayed



House centipede (*Scutigera forceps*): Adult, natural size. Farmers' Bulletin 851.

on account of the many drums of oil that were stacked over the wet places. These should be filled as soon as possible, because countless numbers of mosquitoes are emerging daily and the longer the delay the more mosquitoes we will have. Filling in several bad places on the station has relieved the situation to some extent. Oiling of the mosquito breeding places outside of the station should be attended to, as well as the cutting of the weeds on either side of the station. Most of the river high-tide pockets are stocked with minnows, and what few salt-water forms may be present are kept silent. A total of 76 gallons of crude oil has been consumed in the antimosquito work since June 30.

Hymenoptera, ants, bees, and wasps may inflict such a poisonous sting as to temporarily paralyze a limb or portion thereof. Ants may, on account of their abundance about dining rooms, galleys, and pantries, contaminate such foods as they come in contact with.

Many times they have been noted in various offices, no doubt attracted there by fruit or food placed in open containers where they could have access to it. The family Formicidae is represented by several species, most of which are found outdoors.

An application of sodium flouride as mentioned for roaches is very effective, especially if spread so that they will not have an opportunity to go around it. By walking through this material their feet become covered. Then when bathing their feet and legs, which is accomplished by drawing them through and over their mouth parts, the poison is received into the mouth, causing death. Cleanliness is the only sure preventive and should be encouraged, enforced if necessary.

Garbage from the mess halls is disposed of by contract, the contractors removing it every 24 hours. The paper, tin cans, and general refuse is retained after a slight scorching and put on the dump piles. These dump heaps are largely responsible for the countless numbers of flies on the station grounds at present. The men who were supposed to attend to the incineration of this garbage fail to recognize the fact that fuel is necessary in the burning of such a mass of moist material as is usually put on the incinerator at one time. The results can be easily seen—only the small amounts of dry papers and like material would burn. To make bad matters worse this heated mass of refuse was thoroughly soaked down with water and then wheeled to the dump and offered to the flies and rats that abounded. This dump pile is now practically covered with a thick layer of earth. A large amount of fuel is also being used to make sure that the refuse is thoroughly burned.

A splendid sewer system disposes of the sewage from the entire station.

The new incinerator is being constructed with the idea of caring for all of the refuse of the station. It is to be a great deal larger than the one employed at present.

#### Supplies used in the sanitary work at this station:

1 compressed-air sprayer, 3-gallon capacity.	12 conical fly traps.
2 galvanized dippers.	40 gallons of kerosene.
2 boxes of fly paper, 500 double sheets each.	76 gallons of crude oil.
1 pound of arsenic.	1 disinfector No. 3, American Sterilizer Co., Erie, Pa.
6 cans of insect powder, sodium fluoride.	

A large number of men and teams are employed to fill in the low places on the station grounds.

Squads of men on several occasions assist in the fumigation of sleeping quarters, etc.

Carpenters refit and repair screens of the mess halls and heads.

Others are available whenever necessary.

Cuts in foregoing article reproduced from Farmers' Bulletins, Department of Agriculture.



## COLLECTING SPECIMENS.

Circular letter.]

WASHINGTON, D. C., *January 11, 1913.*

To: All medical officers.

Subject: Collecting specimens.

1. The effort is being made at the Naval Medical School to acquaint the classes with the insects, parasites, and diseases encountered at the various naval stations. Therefore, it is the desire of the Bureau of Medicine and Surgery that you forward to the Naval Medical School such specimens as are available. Any insects, parasites, pathological blood smears or tissues that have been collected or can be obtained are urgently needed. From the tropical stations, especially, are the insects and parasites commonly encountered desired. Unclassified insects and parasites will be reported upon when possible.

2. Following is a list of the specific needs and a description of the easiest method of sending. Please send now such specimens as are obtainable to meet the pressing need of a demonstration for the classes:

## WANTED.

Flies and mosquitoes, and any known or suspected disease-bearing insects.

Parasitic worms and eggs: Tape-worms, round worms, flukes, filaria, and ova-containing feces.

Blood smears, showing malaria, filaria, trypanosomes, other parasites or diseases, unstained.

Snakes and poisonous fish-----

Pathological tissue (brief history is essential).

## METHOD OF SENDING.

In box or bottle with sufficient cushioning not to crush. Kill with chloroform if necessary.

Worms in bottle with 70 per cent alcohol. Feces in bottle with equal amount 10 per cent formalin.

Smears on slides packed in cotton slide boxes.

In 10 per cent formalin or 70 per cent alcohol. Make small slit into bag cavity so fluid can penetrate.

In 10 per cent formalin.

Information: Any data as to origin of specimen and clinical significance will be appreciated.

3. Any slides, mailing cases, or other material used will be replaced if requested.

4. Send to: Naval Medical School, Department of Parasitology, Washington, D. C.

W. C. BRAISTED,

*Surgeon General United States Navy.*

## THE NEW NAVAL MEDICAL SUPPLY DEPOT.

The pharmaceutical, medical, surgical, hospital, dispensary, and sick-bay supplies of the Navy are obtained by requisition made out by hospital corpsmen forwarded by medical officer to the naval medical supply depots, of which the main depot is at Brooklyn, N. Y. These requisitions are made out on Form B, Ba, B-dental, and Form 4. At the main depot all these supplies are purchased, tested, and distributed to ships and stations by naval pharmacists. During the war, ships containing these supplies were sunk by submarine and torpedo, and many difficulties in transportation were encountered, but the depot in a wonderful way lived up to its fine reputation. At no time during the war was the depot short of supplies, and at no time did it fail to send supplies promptly to ships before sailing, even on the very shortest notice. At no time was the standard or quality of the articles issued lowered.

A few ships may have been short for a little time of a few articles that failed to reach them because the ship did not enter the port for which it was scheduled, and in a few instances supplies were slightly delayed in their arrival overseas, due to the difficulties of war-time ocean transportation, but in no case was the slight delay serious and in no case was it due to failure on the part of the depot to fill the requisition in record time.

Our entry into the war found the depot still in its old quarters, well stocked in all essentials and prepared for all emergencies, though woefully handicapped for the necessary space in which to work.

As the demands upon the depot grew, additional outside storage space had to be acquired in order to take care of the inflow of new stock to keep pace with the ever-increasing output. All these demands were promptly met, however, and the depot has received numerous expressions of approval and appreciation of its work.

The depot staff worked night and day to prepare and perfect its plans, while continuing the tremendous task suddenly thrust upon it, and kept the largely increased medical department of the Navy well provided with medical and surgical supplies. The new supply depot begun in January, 1918, partially available for storage and issue purposes in July was completed in October, 1918. The entire hospital corps should be proud of the wonderful record made by the small group of pharmacists under the able leadership of Capt. R. P. Crandall, Med. Corps, U. S. Navy, who made possible the efficient distribution of supplies, fully up to the highest standard, at a time when the whole world was in the market for such supplies and when war had depleted the world's stock to a very considerable degree. (Editor.)



## THE NEW NAVAL MEDICAL SUPPLY DEPOT, BROOKLYN, N. Y.

By R. P. CRANDALL, Captain, Med. Corps, U. S. Navy.

The new United States Naval Medical Supply Depot at Sands and Pearl Streets, Brooklyn, N. Y., recently completed, is one of the finest buildings of its class ever constructed in this country.

Located as it is, convenient to the Brooklyn and Manhattan bridges, the navy yard, and the principal railroad terminals, the situation is ideal for the prompt receipt and delivery of medical stores.

The new depot is an eight-story building, 102 by 103 feet, of brick and reinforced concrete, and is fully equipped with all modern facilities for the rapid storing, packing, assembling, and shipping of medical and surgical supplies for the medical department of the Navy.

The basement contains the carpenter and machine shops, fitted with individual motor-driven woodworking machines of the latest type and design. The heating plant and space for the storage of lumber, coal, and excelsior is also here provided.

The first floor is used exclusively for receiving and shipping, the loading and unloading platforms being so constructed as to handle four large trucks at a time.

The second floor is fitted with tiers of steel shelving, curtain cabinets, narcotic safes, rolling and stationary tables and ladders, and every modern device for the prompt, efficient assembling and packing of requisitions. By duplicate arrangement of articles on the shelves, two sets of packers can assemble and pack at the same time without interference. Dental supply and surgical instrument rooms are also situated on this floor.

On the third floor are combustible, liquor and narcotic vaults, and steel shelving containing the necessary articles to equip expeditionary cases, hospital corps pouches, regimental and field hospital, medicine, and boat boxes, etc.

The fourth, fifth, sixth, and seventh floors are devoted exclusively to storage in bulk, so aisled as to permit easy access in handling.

On the eighth floor are the chemical, physical, and research laboratories, the testing department, sample and stationary stock rooms, and the offices.

Two freight and one passenger elevator, a double spiral chute and two fireproof stairways provide for adequate intercommunication and conveyance.

The building is protected from fire by the sprinkler system in addition to the usual devices. Ample rest rooms, locks, and lavatories are provided, and the building is supplied with gas, hot and cold water and electricity, and is modern and up to date in every way.

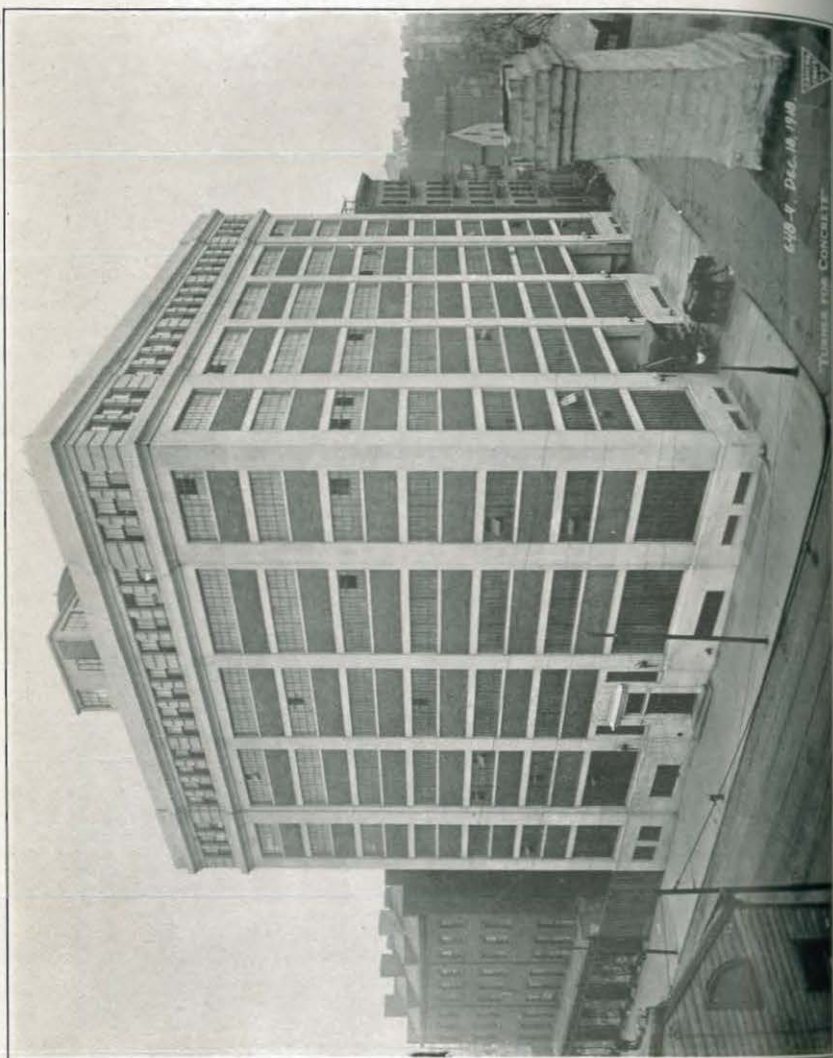


FIRST NAVAL MEDICAL SUPPLY DEPOT.



SECOND NAVAL MEDICAL SUPPLY DEPOT.





NEW BUILDING, THIRD NAVAL MEDICAL SUPPLY DEPOT.

TURNS FOR CONCRETE

640-9, Dec. 16, 1948

The tentative plans were prepared by the commanding officer and the depot staff after much study, care and consultation, and required little or no change during the construction of the building.

Telephonic connection is maintained by the dictograph system connecting all departments, and an electric clock with ship's bell attachment registers the time in the offices and laboratories.

The total floor space of the building is 90,000 square feet as compared to 37,000 square feet, in the old depot. Even with this increased area and 66,200 square feet additional outside storage, the depot finds itself embarrassed for sufficient space in which to handle its ever increasing activities, including as they do the equipment of new ships and stations and the continuous receipt of returned stores from abandoned stations at home and abroad.

During the last quarter of 1918, the depot filled 1,568 requisitions, representing a money value of well over a million dollars, and carrying over to the next quarter over  $3\frac{1}{2}$  million dollars in stock value. The total number of requisitions filled during the calendar year 1918 was 6,207.

The working staff of the depot comprises 15 officers (including 1 dental officer), 25 enrolled and enlisted men, and 104 civilian employees. Five motor trucks and cars handle the depot's transportation.

The supply depot had its origin in the small room over the "pest-house" of the Brooklyn Naval Hospital where a few standard medicines were prepared for the use of this hospital. Gradually, other hospitals were supplied, until it became necessary to erect a building especially for this purpose. This building was constructed and equipped in 1853 in the hospital grounds. It was in this building that Passed Assistant Surgeon E. R. Squibb, U. S. Navy, first experimented in the manufacture of ether by steam heat, a process which materially lessened the dangers of its production. Soon after the close of the Civil War, the depot ceased to manufacture medicines owing to the new and improved methods of manufacture which had come into general use making it possible to obtain material from dealers at much less than the cost of manufacture at the laboratory. The need of a new and more commodious building became so imperative that the building recently occupied by the depot was constructed and equipped in 1906. The present building was occupied in October, 1918.

In obtaining all articles issued by the supply depot to the service, specifications are now prepared for all drugs, chemicals, fabrics, rubber goods, agateware, and all other classes.

The sample submitted by a bidder is examined before making award, and each subsequent partial or complete delivery of the suc-



cessful bidder is examined as to the specified requirements before acceptance.

All cutting surgical instruments are examined at the factory of the successful bidder at the time of forging, and again before hardening, tempering, and finishing.

The inspection of catgut ligatures is made at the place of manufacture before, during and after sterilization and, when the finished material is delivered, further tests are made as to the pliability and tensile strength. A specially designed apparatus is used in testing for tensile strength and breaking strains of textiles, rubber goods, and ligatures.

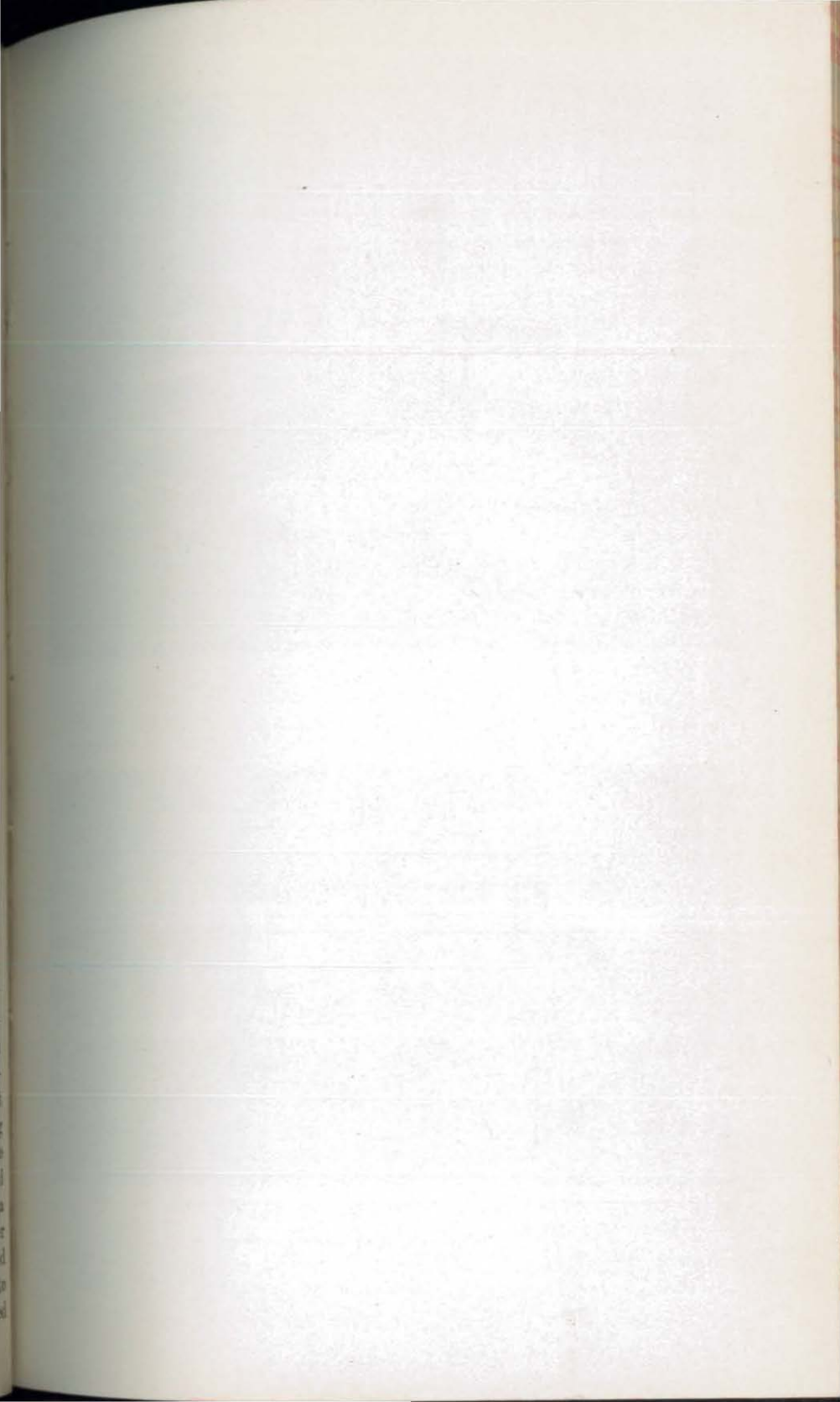
Metallic caskets are inspected individually by an immersion test before acceptance.

All drugs and chemicals are submitted to a complete chemical analysis to determine the compliance with the U. S. P. or other standard requirements. Drugs are frequently rejected as containing dirt, or being improperly labeled, stoppered, or wrapped.

Instruments of precision, such as clinical thermometers, sphygmomanometers, etc., are individually tested by a special apparatus for accuracy before being accepted for issue. The amount of work handled by the testing department of the depot is enormous.

New medicinal preparations, surgical instruments and appliances, etc., are constantly being examined and tested with a view to their employment in the service.

During the war market conditions changed very considerably. Certain preparations such as novocain, eucain, and ichthyol were practically out of the market, while others, such as antipyrine, phenacetine, etc., were for some time prohibitive in price. Accordingly the depot, after experimenting with several preparations, found one that could be substituted for ichthyol, having practically the same properties. Acetanilid was substituted for phenacetine and antipyrine, etc. Thus it will be seen that while it seemed an easy matter to make out and send in a requisition, it was by no means so easy to fill. The continuous rise in the price and the scarcity of raw material, especially in certain metals, often caused considerable delay in obtaining the finished article. Upon the receipt of an approved requisition, the depot's procedure is as follows: The requisition is first carded and indexed in the order of its receipt and then placed among the requisitions to be filled. In its proper order, it then goes to the packing floor and is assembled. The various articles are first checked from shelves, where they are arranged in alphabetical order, to a portable table and then again checked to the assembling table. After complete assembling, the articles are checked and again rechecked into the packing cases; thus reducing the possibility of an error to a minimum. After packing, the cases are labeled and numbered.







Office.



Physical laboratory.

THIRD NAVAL MEDICAL SUPPLY DEPOT.

and notation is made opposite each article on the packing list and file invoice of the number of the case containing it. In this connection, if medical officers would pay more attention to the preparation of requisitions, such as the filling in of all spaces and clipping properly together, it would save the depot untold trouble and annoyance.

As required by interstate commerce laws, certain articles are specially labeled; thus alcohol, collodium, and ether require a red caution label; picric acid, potassium permanganate, and potassium chlorate, a yellow one; nitric acid, hydrochloric acid, and sulphuric acid, a white one; and compressed gases, a green one. In most cases, it is necessary to send these specially labeled goods by express, as most transportation companies refuse to handle this class of goods. The cases being packed, they go to the shipping floor where they are weighed and measured for the preparation of bills of lading. They are then shipped to their destination either direct from the depot by freight or express through the supply officer of the Navy Yard, by Navy transport, or by other public conveyance, and notation made as to same on card index, file invoice, and daily shipping card to Bureau of Medicine and Surgery. On notice of arrival of the shipment at its destination, note is made on card index to that effect, thus completing the transaction.

Should any of the articles on the requisition be an extra article or not in stock, a request is made to the supply officer with a list of dealers to whom the proposals are to be sent asking for bids on the articles required. Specifications accompany the request and sample is required where possible. After a stated time, the bids are opened at the Supply Department and forwarded to the depot for recommendation as to award.

The bid that meets the full requirements of the specifications and is satisfactory as to sample submitted is accepted. Should the delivery of the successful bidder be not equal to sample submitted, it is rejected. An immediate replacement is requested. If the delivery is not replaced within a reasonable time, the supply officer is requested to purchase the article in the open market against the firm's account, the difference being charged to the firm failing to make the delivery.

The depot's stock is kept up by annually approved requisitions covering all classes of articles issued. Successful bidders must supply at least 50 per cent of the required article and not less than 10 per cent at any time when called upon to do so, and must further agree to supply more or less of the amount of the entire lot should occasion require.

Other requisitions covering extra articles or instruments turned in on surveys are made annually, and requests are made under them from time to time during the year.



To estimate the amount required for these requisitions for the ensuing fiscal year, the depot considers the issues for the past fiscal year together with the cost on hand on which to make its basis. Estimates for the present fiscal year were largely increased owing to war conditions.

All other medical supply depots including those at Canacao and Mare Island and the stations beyond the seas are supplied from this depot, also ships and foreign stations. The parcel-post system is also taken advantage of in making small shipments under four pounds in weight to domestic and foreign stations. When a ship in course of construction is sufficiently advanced to receive them, the surgical cabinet, operating table, utensil cabinet, etc., are sent to the construction officer to be installed in the operating room, the instruments and utensils being forwarded later with the necessary outfit when the ship goes in commission. The depot is constantly making additional alterations and improvements as advances in surgical and medical science dictates. In addition to its regular supply table articles, the depot now carries a complete stock of dental equipment, this department being in charge of an experienced dental officer.

Wherever possible, the commanding officer and the depot staff visit the laboratories and factories whence the depot draws its supplies in order to make themselves familiar with manufacture and preparation, with a view to being able to properly draw up the specification based on actual study and observation.

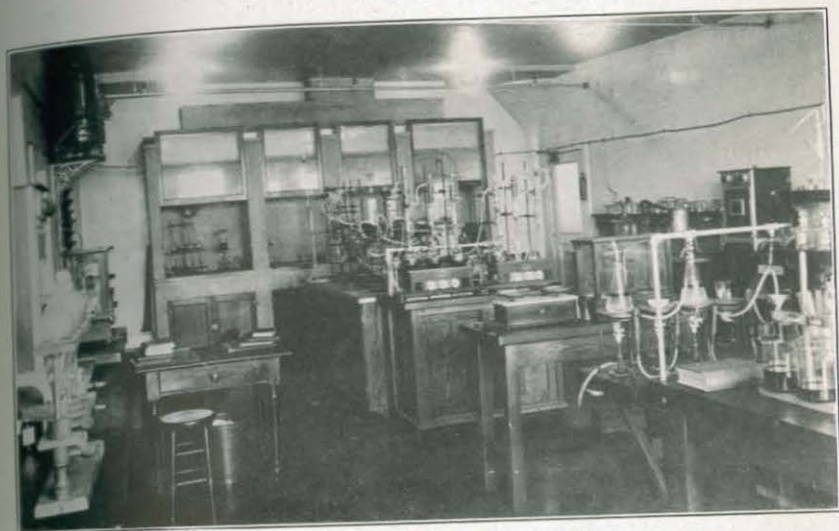
No opportunity is neglected to improve the already high standard of the depot and to increase its efficiency and usefulness to the service.

The commanding officer and the depot staff will always be pleased to receive members of the medical and hospital corps to inspect the new depot.

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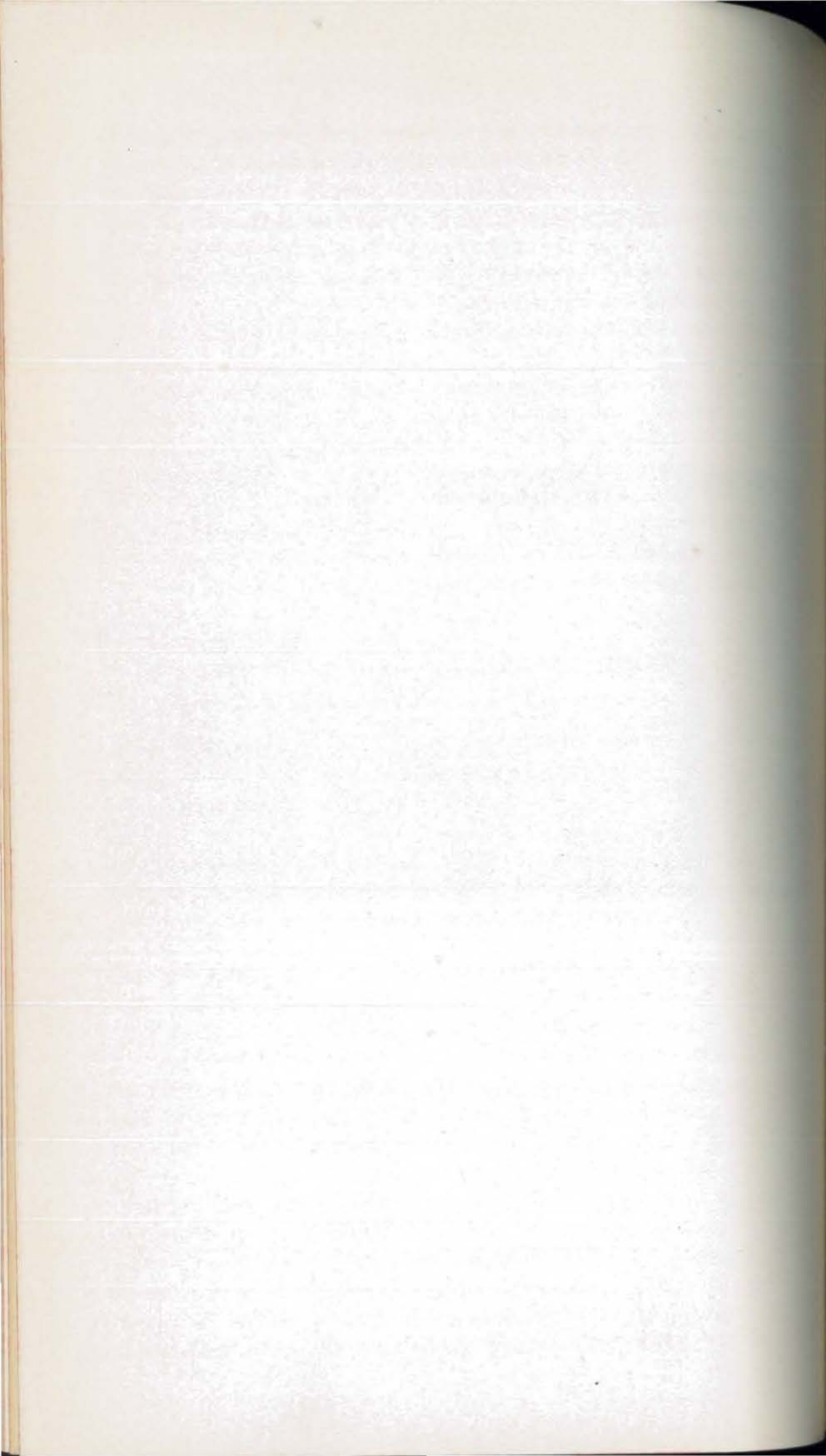
### ACADEMIC KNOWLEDGE.

The Business Director of Dartmouth College has volunteered to interest certain members of the faculty of that college in the Hospital Corps and to contribute to the pages of the SUPPLEMENT a series of articles, the purpose of which is to keep alive in the minds of hospital corpsmen an interest in academic studies. Many are the things which interfere aboard ship or in the naval station with the natural desire of the young man to improve himself, but he who decides to take advantage of every opportunity will find moments and sometimes hours when he can pursue some study of general interest in addition to the studies which he must pursue to keep up in the special work of the Hospital Corps. In the ships' libraries and in the libraries of



CHEMICAL LABORATORY, NEW BUILDING.





shore stations, can be found books on travel, law, biography, in addition to works of fiction, and it may be that this series of articles will guide or assist the ambitious hospital corpsman in increasing his general knowledge, or in keeping alive his interest in matters of general information and thereby make him a better, more intelligent, and more capable hospital corpsman, and add to his ability to win out, whether in the Navy or in civil life.

Chemistry and physics are academic subjects in which every hospital corpsman should interest himself, and already the SUPPLEMENT, in its January, 1919, number printed an excellent article on chemistry written by Prof. C. W. Cuno and one which outlines a course in pharmacy and chemistry self-taught by Lieutenant L. C. Sims, (Medical Corps) (T), U. S. Navy.

The first article of this Dartmouth College series appears in this number of the SUPPLEMENT, and is entitled "French self-taught." Other articles on English, mathematics, and economics will appear in later issues.—(Editor.)

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## BEGINNERS IN FRENCH SELF-TAUGHT.

By PRESCOTT ORDE SKINNER, Professor of Romance Languages in Dartmouth College.

Nobody with a competent knowledge of the principal European languages would accuse me of exaggerating in the three short paragraphs which I once wrote on the educational value of French. Here are my words:

"The cosmopolitan character of the French language, due to the cultivation in all countries, has rendered it perhaps the nearest approach to a universal vehicle for the expression of commercial, diplomatic, and social relations as well as for the interchange of conceptions of an aesthetic and intellectual nature. From a practical point of view this universal quality makes French an indispensable language for the general traveler or the diplomatist and of great possible value to the man of business.

"Because of the considerable activity of France in the fields of engineering, medicine, mathematics, history, philosophy and the sciences, a reading knowledge of the French is important to the specialist in almost any profession.

"Moreover apart from all practical considerations, the aesthetic and intellectual satisfactions to be derived from the study of one of the world's great literatures offer in themselves sufficient reward to the serious student in the subject. French literature, in the course of its nine centuries of consistent excellence, has carried to a higher degree, perhaps, than any other, the quality of clearness of expression



and attention to form, joined to a most characteristic devotedness to pure ideas. Finally, the literature of France reflects with such definiteness the country itself that in no other way can a student gain so clear an understanding of a great foreign civilization."

Now, if you have accepted these claims of the French language, you must be already convinced that any amount of time and effort devoted to the study will be ultimately justified; and for the difficulties involved in the task you will regard them as a test of your power of will and consideration. To invite you into the work I will make some practical suggestions, which, though useful to any learner, whatever may be his object, are intended chiefly for those who would pass the College Entrance Examinations in French.

The ambitions of such students should be limited to the so-called *elementary examinations*, which assume two years of the subject as studied in the school.

Roughly speaking, the candidate must have read at least 500 pages of French prose; he must be familiar with the forms and uses of the different parts of speech; and, finally, be able to turn simple English into French.

For precise information you are advised to write to the College Examination Board, 431 West One hundred and seventeenth Street, New York City. Specimen examinations may be obtained when desired from Ginn & Co., Boston, at a normal price.

Assuming, then, that you are beginning the French language without the services of the teacher, you are confronted at once with what is, perhaps, the most perplexing of your difficulties—the acquisition of an approximately correct pronunciation. I believe, though, that if you will study intensively a small text book known as *Liberty French* (to be had from the Associated Press, 347 Madison Avenue, New York, 20 cents per copy) giving special attention to the phonetic guide spelling, many of your difficulties will be solved. In fact, I urge you to begin with this booklet, and to work through it as far as page 53; and not to forget to consult frequently the alphabet guide on page 52. Of course, the vocabulary at the end of the book will be necessary for translating the English into the French. This little manual fits into any pocket, and can be referred to at all sorts of odd moments.

If, now, you have studied and received your *Liberty French*, you are ready to take up some simple elementary grammar, the simpler the better. I recommend Gies and Cerf, *Simplest Spoken French* (Holt & Co., New York). You must memorize at any cost your verb forms. All the regular verb models must be mastered in addition to such irregular verbs as seem to you as usable in ordinary discourse.

To accompany this book procure, if possible, a copy of *Storm French Dialogues* (Macmillan & Co., New York). This book

colloquial French is most admirably adapted to the needs of the teacherless student; he will find by experimenting the best method of mastering its contents. Go slow at first, reading the English, then pronounce the French version, taking pains in the earlier lessons to analyze and comprehend the construction of each word.

Other books to follow the dialogues or to take its place in case this is unattainable, are Patton, *Causeries en France*; and Lyon, *Primary French Translation Book* (both published by D. C. Heath & Co., New York).

With the above recommendations you have a plan of study that may take a year or more, according to circumstances. Your work during this period must be deliberate and thorough. Make a point of doing at least a small amount each day.

As the examination time approaches you must speed up reading the required number of pages in some texts mentioned in the College Entrance Board recommendations. This is the time to also rush through a somewhat larger grammar, and to practice turning simple English prose into French. If you have an opportunity to follow my last suggestion, you will do well to procure Francois' *Introductory Composition* (Holt & Co., New York).

A student of average ability, provided he has carried out the recommendations so far offered, may be practically assured of passing his entrance examinations. Of course, he will take every occasion to consult friends familiar with the subject, especially on matters of pronunciation. Several students interested could club together for the purchase of some of the *Language Phone Method* disks, which can be used on any Victrola. Information about these French records may be obtained in a booklet furnished on application by the Language-phone Method Co. (915 Putnam Building, 2 West Forty-fifth Street, New York). The Victor Talking Machine Co. (Camden, N. J.), also manufactures a few records for teaching French pronunciation details about which are supplied in a special catalogue.

To get profit from hearing a French record on a Victrola judgment must be used in controlling the speed, and one must not be bored in hearing the same record dozens of times.

All these helps toward acquiring a correct pronunciation, I have suggested, because I feel the importance of this branch of the study. Not only will a fair pronunciation make possible a more satisfactory interchange of ideas with a native Frenchman, should occasion arise, but it has a practical value for the student heading for an eventful examination. A fair pronunciation, and that is, perhaps, all that can be hoped for, is of great help in forcing the French idiom and inflections to cling to the memory.

Some of the textbooks indicated by me will explain adequately the sounds of the various French vowels and consonants; however, cer-



tain sounds require very special attention. The sound written *u* for example does not exist in English. To those who know German it is only necessary to say that it resembles the *ü* in *über*. It is pronounced by preparing the tongue for the English sound *ee*, and at the same time protruding the lips, in a whistling position, as if to utter *oo*. The result will probably be a fair approximation to the French *u*.

The sound of *g* before *e* and *i* and of *j* always is not far from the sound of *s* in the English word *leisure*. *Qu* is usually equivalent to the English *k*. *R* is slightly trilled; this sound requires in some cases, considerable practice. The so-called nasal vowels, which do not exist in English, must not involve the English *ng* sound as in *sing*. To learn to pronounce *an*, for example, when representing the nasal vowel it is only necessary to utter a prolonged English *ah*, gradually letting some of the breath escape through the nose. These nasal sounds should end with the mouth open.

No easy matter for the foreigner is the question of voice stress in a French word or phrase. The best advice for a beginner is to aim at monotony; later he can vary his stress in imitation of the native. Do not emphasize one syllable at the expense of another, except for a slight extra leaning on the last syllable. For example, in English we say universality with a heavy stress on the fourth syllable *sal*. In French the corresponding word *universalité* is uttered u-ni-ver-sa-li-té with equal stress on each syllable, and a slightly stronger stress on the final.

The manuals recommended will clarify the difficulties in French grammar, at least as far as is necessary for beginners. It is not a bad plan to possess a large grammar for consultation only, such as Fraser and Squair's Grammar (D. C. Heath & Co., New York), and a dictionary the best being Gase's French Dictionary, students' size (Holt & Co., New York). If you will apply the ages old qualities which lead to success, there will be no disappointment awaiting you when you learn the result of the test that may determine your admission to an American college.

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## FINGER PRINTS.

By J. H. TAYLOR, Finger Print Division, Bureau of Navigation.

Those interested in the study of finger prints will find the following-named books of great assistance:

Sir E. R. Henry's book on "The Classification and Uses of Finger Prints," sold for \$1.56 by The Detective Publishing Company, 1020 Wabash Avenue, Chicago, Illinois.

Manual for the Medical Department, U. S. Navy, 1917, pages 134 to 139.

"How to Obtain Good Finger Prints." This book is issued by the Bureau of Navigation and will be furnished if requested.

The Identification Office for the Navy now has on file the records of 1,000,000 men, and it is believed to be the largest in the world. It is impossible for an officer or enlisted man of the Navy to lose his identity as the finger prints of every man who has enlisted in the Navy since January 1, 1907 are now classified and on file.

#### APPARATUS.

The finger-print apparatus is furnished by the Bureau of Navigation.

The apparatus for taking finger prints consists of a form holder, an ink plate, and a roller for spreading the ink on the plate. The roller and ink plate should at all times be kept clean and free from dust, grit, or hairs, and the ink tube closed when not in use. The roller and plate should be thoroughly cleaned after each day's work.

Preparatory to taking finger prints squeeze a small quantity of ink from the tube and carefully work it, by use of the roller, into a thin film on the plate, the spreading of which may be facilitated by frequently turning over the roller. If too much ink is used, the impression will be blurred and consequently unsatisfactory. The thickness of the ink after being spread on the plate should be less than one-half the elevation of the ridges, and this can be tested by taking impressions.

The recruit should wash his hands thoroughly with soap and brush, using, if practicable, running water, especial care then being taken to rinse off all soap or lather with cold water. Failure to do this will cause white blotches to appear in the impressions. Immediately before placing the fingers on the inked plate, the fingers should be well wiped with a cloth dampened with benzine or ether, which should remove all trace of grease, water, or perspiration.

Two kinds of impression are used, "plain" and "rolled." A plain impression is obtained by pressing the bulb of the finger, with the plane of the nail parallel to the plane of the plate, on the inked plate, and then on the paper in the same manner. A rolled impression is obtained by placing the side of the finger on the inked plate, with the plane of the nail at right angles to the plane of the plate, and rolling the finger over from one side to the other until the plane of the nail is again at right angles to the plane of the plate, but with the bulb surface of the finger facing in the opposite direction, thus inking the surface of the finger, and then rolling the finger over the paper in the same manner, in this way obtaining a clear impression



of the ridges on the surface of the finger. This latter impression should include both the palmar surface and the sides of the finger between the tip and the flexure of the last joint. Always roll the fingers from the awkward position to the natural position.

The rolled impressions are taken in order to obtain the whole contour of the pattern. From the rolled impressions the counts and tracings are obtained for the secondary classifications. The ridges in a loop from the delta to the point of the core must be sufficiently clear in order that they may be counted accurately.

In whorls the ridges should be clear in order that they may be accurately traced from the left to the right delta. It is particularly desired that the rolled impressions of the right and left little fingers should be clear and without blur. If an impression is damaged or blurred so that the ridges can not be accurately counted or traced, it is necessary to search this print through a number of other combinations, which would have been avoided if the impression had been properly recorded.

The method of obtaining the plain impressions is to take each of the fingers in turn and place the bulbs only on the inked plate. When this is done, press the recruit's fingers together, and with his hand limp and flat (not bowed or arched), place it in the space shown on the form and press each finger at the base of the nail lightly. No attention need be paid to the deltas in the plain simultaneous impressions, but the detail must be clearly defined. The plain impressions are taken to determine whether or not the rolled impressions are in their proper sequence.

The identification system in operation in the Navy was devised by Sir E. R. Henry, commissioner of police, London, England.

There are four types of impressions: Arches, loops, whorls, and composites.

In *arches* the ridges run from one side to the other, making a backward turn; there is ordinarily no delta, but, when there is the appearance of a delta, no ridge must intervene between the "inner" and "outer" terminus.

In *loops* some of the ridges make a backward turn but without twist; there is one delta. Loops are *ulnar* and *radial*.

In *whorls* some of the ridges make a turn through at least one complete circuit; there are two deltas. Whorls are single cored or double cored.

Under *composites* are included patterns in which combinations of the arch, loop, whorl are found in the same print; also impressions which might be deemed to present features requiring their designation as being loops in respect of the majority of their ridges and whorls in respect of a few ridges at the centre or side. These are



FINGER PRINT (ENLARGED, SHOWING WHORLS, LOOPS, AND DELTAS).





FILING AND CLASSIFYING FINGER PRINTS, NAVY DEPARTMENT.



HOSPITAL CORPSMEN LEARNING TO MAKE FINGER PRINTS.

subdivided into *central pocket loops*, *lateral pocket loops*, *twinned loops*, *accidentals*.

Central pocket loops, lateral pocket loops, twinned loops, and accidentals are all classified as whorls.

Loops and arches have no numerical value.

Whorls and composites are given a numerical value according to the fingers in which they are found.

A whorl or composite in the right thumb has a numerical value of 16; right index finger, 16; right middle finger, 8; right ring finger, 8; right little finger, 4; left thumb, 4; left index finger, 2; left middle, 2; left ring, 1; left little finger, 1.

The values given to whorls found in the right thumb, right middle finger, right little finger, left index finger, and left ring finger are added together for the denominator, and to this number one is always added.

The values given to whorls found in the right index finger, right ring finger, left thumb, left middle finger, and left little finger are added together for the numerator, and to this number one is always added. The numerator and denominator thus obtained is called the primary classification number.

A loop in the right index or left index fingers is marked "inner" when there are nine (9) or less ridges intervening between the delta and the point of the core. When it has ten (10) or more, it is marked "outer." A loop in the middle finger is marked "inner" when there are ten (10) or less ridges intervening between the delta and the point of core. When it has eleven (11) or more, it is marked "outer."

A whorl is traced from the left to the right delta. If the ridge traced goes three (3) ridges inside of the right delta, the whorl is marked as inner. If the ridge traced meets the right delta or is less than three (3) ridges on either the in or outside of the right delta it is marked "meeting." If the ridge traced goes three (3) ridges on the outside of the right delta, it is marked "outer."

It is obvious that in taking finger prints all of the impressions must be clear and free from blur, in order that they may be accurately classified. In taking impressions the operator himself should manipulate the hands of the recruit, who should be directed to relax his fingers and not to attempt to assist by adding to the pressure on the inked plate or on the paper. In order that the ink may be taken up on the finger evenly and in sufficient quantity, an unused part of the plate should be selected each time for inking the finger, and when no unused part of the plate remains the ink should be redistributed with the roller or the plate re-inked. See that there are no clots of ink where the fingers are to be rolled on the plate.



An experienced operator in taking finger prints should be able to obtain finger prints that will be so well defined as to show the pores in the ridges. It is necessary to have an ink roller that will not be affected by atmospheric conditions.

In taking the finger prints of a dead man the best impressions may be obtained by cutting the blank form 2 up, inking each finger separately with the roller; then roll the fingers separately on the pieces of the blank form, and paste them together in their proper order. In a great many instances it is impossible to roll the fingers of a dead man, but by rolling the pieces of the blank from around the fingers clear impressions are obtained.

Ridge characteristics are the abrupt endings, beginnings, and bifurcations of ridges and islands. The identity of a person is established by ridge characteristics.

The skin on the finger tips of the bodies of men which have been recovered from the water will be greatly wrinkled or shriveled, so that without some treatment the making of satisfactory prints may be difficult and even impossible. The way to overcome this is to inject water with a hypodermic syringe beneath the skin of the body of the finger. This will smooth out the skin for the impression.

In the preparation of identification tags for officers and enlisted men of the Navy, special care should be taken to see that the printer's ink is properly thinned out with turpentine, so that it can be easily written with. The acid bath should be one part nitric acid and two parts of water. If there are three hundred (300) drachms of nitric acid and water, there should be added ten (10) drachms of hydrochloric acid to properly etch the tags. After the tags have been dipped in the powdered asphaltum and heated over an alcohol lamp they should be allowed to cool before being placed in the acid bath to etch. See general order No. 294 of May 12, 1917.

To place the service number on identification tags, write the service number on the tag with printer's ink which has been thinned out with turpentine. After this is done, the tag is again dipped in powdered asphaltum. Some of this will mix with the ink and stick to the surface, the rest should be brushed off with a camel's hair brush. Heat the tag until the surface of numbers become glossy and then allow the tag to cool. After this is done place the tag in the nitric acid bath prepared in accordance with instructions given in General Order No. 294 of May 12, 1917, and let it remain until the numbers are properly etched. Particular care should be taken in removing the surplus ink and powdered asphaltum from the identification tag, except from the numbers, when the tag is etched the second time. The tag should not remain in the acid long enough for it to become thin.

Finger prints were first used by the Chinese about the year 400 B. C. They used thumb marks on wills and documents. Each heir to an estate was required to place his thumb mark on the will in order that an impostor could not share in the division of the estate. In Japan, finger prints were used for prisoners. A man convicted and sent to prison was not known by his name, but by his thumb mark.

In India, finger prints were also used on wills and documents and all pensioners were required to record their thumb prints. In Australia, South America, and Africa thumb prints were used in paying off Negro employees to prevent them from drawing the pay of others.

Up to the year 1900, the value of finger prints was known as a positive means of identification, but there had never been any system devised to classify and file the finger prints so that they could be found at a future date. Such a system was devised by Sir E. R. Henry, commissioner of police, London, England, and installed in Scotland Yard for the detection of criminals. This system is now installed in practically every police department throughout the world and has been found to be of the greatest assistance in identifying criminals.

Dr. Henry P. DeForest, medical examiner for New York City, introduced finger prints in the municipal civil service commission a short time after the system was installed in Scotland Yard to prevent frauds in examinations. It was known that one man would take an examination, and pass, and then he would turn his papers over to another person who would obtain the position. Now when a man takes a physical examination in New York City his finger prints are recorded. When he presents himself for his mental examination, his finger prints are again taken, and also when he is appointed his finger prints are taken. By this plan it is impossible for anyone other than the man who has actually passed the examination to obtain the appointment.

In the fall of 1906, the finger-print system was installed in the Army, Navy, and Marine Corps for the detection of "repeaters," and was primarily installed for use in time of war for the identification of the dead. Recently in France, a Marine was found in a hospital suffering from shell shock. He could not give any account of himself, and his finger prints were taken and forwarded to the department, where it was discovered that he was a marine who was reported missing at the battle of Chateau Thierry. If it had not been for the finger prints, the identity of this man probably would never have been known, as his mind to this day is blank.

In the Argentine Republic there is a central bureau in which the finger prints of every citizen are filed. This system was installed by



Dr. Juan Vucetich, in order that the identity of every citizen in Argentina may be known in case of accident or death, and now it is impossible for a citizen of Argentina to lose his identity.

It has been the impression of a great many people that finger prints were used solely for the identification of criminals, but this is not the case. It is used by a great many banks for the protection of their depositors, and by the Army, Navy, and Marine Corps for the identification of the dead and wounded, and in time of peace this system is very useful in preventing unscrupulous persons from delivering men to the military authorities as deserters who never had previous service. In the Army, where there are thousands of John Smiths, if it were not for the finger-print system, it would be impossible for any of these men to be accurately identified.

The value of finger prints was thoroughly shown on October 13, 1918, when the dead body of a man was picked up by a British mine layer, 2 miles off the Helwick Light Vessel. A rolled impression was taken from this man's right index finger and compared with the impression on the identification disk found on the body. It was then positively known that this man was Alexander Luis Saldarini, who enlisted in the Coast Guard as ordinary seaman on May 18, 1918. If it had not been for the use of finger prints in the Navy, this man's body would have been buried at sea without his identity ever being known.

The real value of finger prints will be known when a national bureau is established and the finger prints of every citizen of the United States are recorded, and by this plan it would be impossible for anyone to ever lose his identity, as is now the case throughout the country. Finger prints are being used in the Army, Navy, and Marine Corps mostly, now, for the identification of the wounded and dead, and not for the detection of criminals.

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## THE NAVAL PHARMACIST.

By GEORGE F. COTTLE, Lieutenant Commander, Med. Corps, U. S. Navy.

Among the older pharmacists are men who have gained through years of service an intimate knowledge of the naval service, its customs and its needs. These men have served as hospital apprentice, hospital steward, and pharmacist. Among the men of this group there are a few who have been able to add to their well-rounded knowledge of a naval pharmacist's duties special knowledge or experience in some one direction. One may be found whose experience in laboratory methods makes him stand out from his fellows, another whose ability to run the commissary of a large naval base

pital singles him out as a specialist in that particular; another has studied property accounting until he is exceptionally able in that field; another has specialized in gathering and compiling vital statistics; another has had special opportunities to learn the difficulties of placing a new naval hospital or the medical department of a new dreadnaught or navy transport in commission; another has found himself developing special knowledge of office management, correspondence records, and filing; another has taken up the interesting field of sanitary inspector; another has found himself called upon to make physical and chemical tests of a difficult nature; another has worked hard to keep the Navy's medical, surgical, and pharmaceutical supplies up to the highest possible standard; another has found himself called upon to supervise the work of compounding prescriptions; another has developed special ability as an X-ray technician; another can drill a battalion; another instruct a class.

Is there one of these men with special ability in some particular field who has not an all-around ability as well? Is there one of these who, after change of station brought him in contact with a change of duty, could not make good wherever he has been sent by the Navy Department?

In the small naval hospital with one pharmacist it should never be possible to find any lack of ability in that pharmacist in the performance of the duties laid down for him by the Naval Regulations and Manual Medical Department, chapter 4. In the large naval hospital with more than one pharmacist there is often sufficient work to allow some specialization of detail; one pharmacist may be given charge of the commissary; another of the office management, correspondence, and files; another of the property accounting; another may find an opportunity to specialize in X-ray or in the laboratory, in teaching hospital corpsmen pharmacy, chemistry, hospital corps drill, etc.

Every pharmacist who finds himself developing along some special line should nevertheless continue his interest in and maintain himself in readiness to take up at once with success any and all of the duties laid down for him. At any time he may find himself separated from the special duty in which he is most interested and called upon to "get away" with a different kind of work. The exigencies of the service, necessary change in station, due to alternation between sea and shore, changes due to the enlargement of the field of the pharmacist and the rapid and important changes that come in time of war, make too great a degree of specialization unsafe for the naval pharmacist unless to such special knowledge and ability is added an all-around ability.

It would seem that the naval pharmacist who adds to his general ability an intimate knowledge of the technical side of the bacterio-



logical laboratory or of the X-ray department of the naval hospital would thereby increase his value in the service and allow him to take one more step forward with the doctor who has come to realize that a knowledge of the latest laboratory methods and of the latest development in the field of Roentgenology is of at least as great value to the sick and injured as is a well thought out and carefully compounded prescription.

Shortly after this number of the SUPPLEMENT has been distributed the competitive examination for permanent pharmacist grade will be held and the candidates' answers will start toward the statutory board in Washington. It is hoped that the candidates who are successful before this board will be those who have proved an all-around ability in, and knowledge of, the needs of the medical department of the naval service and whose records have demonstrated a loyalty, interest, energy, enthusiasm, and ability which will make them develop into as good men as have the leaders among those who have been selected by such boards in the past.

## THE WORK OF THE NAVAL PHARMACIST.<sup>1</sup>

By C. SCHAFER, Lieutenant, Med. Corps, U. S. Navy.

I shall endeavor to clearly describe the wide range of employment affecting Navy pharmacists in the hope that my remarks will serve to give the civilian members of the profession at least a general idea as to the character of our work in the service.

The Bureau of Medicine and Surgery, having as its chief the Surgeon General of the Navy, has supervision over a personnel separated into four distinct corps: First, the Medical Corps, composed of members of the medical profession holding commissioned rank in the several grades of surgeon as provided for in the law; second, the Dental Corps, composed of members of the dental profession holding commissioned rank in the several grades of dental surgeon; third, the Hospital Corps, composed of enlisted men of the Navy, warrant officers known as pharmacists, and chief warrant officers known as chief pharmacists; and fourth, the Nurse Corps, composed of women nurses serving in the naval hospitals.

The whole organization is known as the medical department of the Navy and its primary duty is to preserve the Navy's personnel from sickness and injury and to return the sick and injured to active duty in the shortest period consistent with circumstances.

Since the activities of the Hospital Corps include the handling of drugs and other medical department stores, an outline of the

<sup>1</sup> Address delivered before the College of Pharmacy, Columbia University, New York, Jan. 21, 1919.

duties in that corps will undoubtedly prove of special interest here. I shall first undertake to describe briefly the climb of a hospital apprentice, second class, from the lowest rating in the corps to the rank of chief pharmacist, the highest rank in the corps.

The recruit without previous experience or professional training enters the Hospital Corps in the rating of hospital apprentice, second class. One who has had some training in nursing, or who studied pharmacy, chemistry, may qualify on entrance for the rating of hospital apprentice, first class, and his advancement may prove more rapid. Immediately upon being enlisted in either of the ratings just mentioned, the recruit is sent to one of the Navy hospital corps training schools, where he is given a course of an intensive nature with a view of training him to assume the duties of an assistant in the medical department on board ship.

The school course covers the following subjects: pharmacy, materia medica, chemistry, first aid, hygiene, laboratory technique, general and special nursing, minor surgery, diet, operating room technique, including the care and preparation of instruments for operations, and also the preparation and sterilization of all dressing materials. The men are also instructed in the rudiments of anatomy; they are instructed in the care of their persons, including the care of clothing. The students are of course given thorough training in the method of handling the sick and in transportation of the injured; in the hospital corps drill, and, furthermore, they also receive the general military training considered so necessary to fit a man for the Navy life.

The school term of approximately six months is extensive enough to permit us to cover each subject in such a manner as to lay the basis for further study and advancement on the part of the students, and also to cull out those in the service who show inaptitude for that kind of duty. Upon the completion of this first training, the men are distributed among the vessels of the fleet where they receive further instruction under the supervision of the medical officers, the pharmacists and the enlisted members of the Hospital Corps holding advanced ratings acting as instructors. Upon acquiring further knowledge and experience the men are successively advanced, first to the rating of pharmacist's mate, third class, a third-class petty officer in the Navy (equivalent to the grade of corporal in the Army). After serving a period of time as a third-class pharmacist's mate, a man becomes eligible for further promotion to the rating of pharmacist's mate, second class—a second-class petty officer in the Navy—for which the Army, I believe, has no corresponding grade; a man is then passed by examination and on his record to the rating of pharmacist's mate, first class—a first class



petty officer (equivalent to the grade of sergeant in the Army); finally, the hospital corpsman becomes eligible to be examined for the highest enlisted rating in the Hospital Corps, that of a chief pharmacist's mate—a chief petty officer in the Navy (equivalent to the grade of first sergeant in the Army). Advancement beyond the rating of chief petty officer is to the warrant rank of pharmacist, and after six years of this rank, to the chief warrant officer rank of chief pharmacist.

A chief pharmacist's mate is not only so well trained that he is able to pass the comprehensive, oral, practical, and written examination required, but he is in addition a man who has a particular fitness for the Hospital Corps. He is a man who has the force of character necessary to control men and to maintain discipline. He is a man who has shown by his conduct a good example of subordination, courage, zeal, neatness, and attention to duty, and one who has convinced the officers with whom he has served that he is capable of taking charge of hospital corpsmen at drills, of controlling their work and planning details for their employment.

A man eligible to be examined for the warrant rank of pharmacist should, in addition to his eligibility as determined by the Navy Department, be first a well trained, experienced, capable and dependable chief pharmacist's mate who has a thorough and complete knowledge of the clerical duties of the medical department, one who is capable of the management of sick bays and hospital wards, and, one who is prepared to demonstrate by an oral, written and practical examination, a thorough knowledge of pharmacy, materia medica, toxicology, chemistry, minor surgery, hygiene; including examination of foods and inspection of hospital stores in general.

One must bear in mind that the value of a hospital corpsman is not measured entirely by his theoretical knowledge. The mere fact that a hospital apprentice has passed through a training school for hospital corpsmen with a high grade does not make him a valuable man to the Navy. He must, of course, have the education, but, his usefulness and real value is dependent almost entirely on how he loosens up, on how he adapts himself to the Navy life, and to Navy conditions. It depends on his readiness to apply his schooling to every day problems, and, it also depends on how much of his efforts ultimately prove of benefit to the Navy. The experience necessary to develop an all-around capable and dependable Navy pharmacist is acquired only by direct contact with the many duties. A pharmacist is a man who has qualified by examination and who has convinced the Board of Examiners that his education together with his Navy service experience and his Navy record has in reality produced an individual who is quite capable of handling the many duties expected of him.



The term pharmacist is given a far wider meaning in the Navy than in the civilian establishment. It is true that the Navy man's knowledge on the subject of pharmacy may be taken as a fair index bearing on his ability and general usefulness in the service, but his success is probably due more to the manner in which he applies his pharmaceutical knowledge to branch and broaden out in the other subjects with which he must be familiar. The officer holding an appointment as pharmacist is in reality a material officer, in so far as it concerns supplies for the medical department of the Navy; he handles the stock, the property; he prepares requisitions for all equipment and must therefore be equally familiar with the requirements concerning supplies for operating rooms, the laboratories, the wards, the drug and other departments.

The result of the pharmacist's experience with medical department supplies enables him to lay down in the specifications such requirements as he considers necessary to more satisfactorily meet existing conditions, or to meet the conditions which might arise owing to climatic or other influence.

In hospitals the pharmacist also acts as commissary officer; he has charge of the entire subsistence department; he also plans the detail of employment for the Hospital Corps, and he generally also has charge of the hospital records and records offices.

The period of duty in the Hospital Corps is divided between sea and shore; thus the Navy pharmacist is found on board ship where he serves for a period of time to be followed by a term of duty at a shore station, be it a hospital, supply depot, training school, or Marine Corps regiment.

I might add here that the Marine Corps forms a branch of the Navy; this corps draws on the medical department of the Navy for its medical officers, dental officers, and hospital corpsmen; its medical supplies are issued by the Navy, and members of the Marine Corps incapacitated for duty are treated in our naval hospitals in the same manner as the men of the regular Navy.

To delve into the details of the separate duties affecting Navy pharmacists would probably prove too long and monotonous as we would necessarily have repetition. I will therefore describe only the employment of chief pharmacists and pharmacists in the naval medical supply depot, bearing particularly on their duties in the testing department of the institution.

The responsibilities pertaining to medical supplies lie with the medical supply depots, the main depot being located in Brooklyn. This depot is commanded by a captain in the medical corps of the Navy. Nearly all supplies for the medical department of the entire Navy pass through that depot. The organization is divided into



two departments; the executive department and the testing department.

The executive department is in charge of a chief pharmacist who is assisted by a number of pharmacists and enlisted men of the Hospital Corps. This department is responsible for carrying out the official desires of the commanding officer; it has to do with the administration of the depot; it is responsible for the amount of stock on hand and for the promptness with which requisitions for supplies are filled and delivered to ships and stations.

The testing department is also in charge of a chief pharmacist who is assisted by pharmacists and enlisted men of the Hospital Corps. This branch of the organization is responsible for the quality and kinds of supplies; it formulates all specifications; it passes on all proposals submitted by bidders, and also passes upon the quality of materials delivered by all contractors.

It is a noteworthy fact that during the war the medical supply Depot of the Navy always had on hand sufficient stock to meet all requisitions in full without any fear of running short, or of even approaching the danger line; and furthermore, during this period the supply depot never found it necessary to reduce the high standard of quality.

I will not touch on the supply depot's methods of keeping account of stock. This involves an elaborate system of bookkeeping and would probably not be of much interest to the civilian. I will, however, outline the functions of the testing and laboratory departments.

The organization in the testing department is in five divisions:

1. Specifications division, where complete specifications are framed on each item carried in stock, be it an article of drug, chemical, glassware, surgical instrument, operating-room equipment, or bedding, X-ray, or whatnot. In formulating specifications care must be exercised that efficiency is served without the imposition of noncommercial conditions.

2. The drafting and blue print division, where sketches and blue prints are prepared for distribution, with specifications, among contractors and prospective bidders.

3. The chemical laboratory, where chemical investigations are conducted on all materials requiring this.

4. The physical laboratory, in which the physical properties of certain classes of material are investigated to determine their compliance or non-compliance with specifications.

5. The bacteriological laboratory, in which the disinfectant values of certain products are determined and where the sterility of others are investigated.

Members of the testing staff are all service people who are fully qualified professionally, and all of whom must be well informed on industrial methods of manufacture and must also possess a thorough practical knowledge of service conditions.

Aside from the routine work of inspection, all problems involving stores are submitted to the testing department for comment; all suggestions originating in the service or submitted by outsiders are investigated and passed upon by that department.

To give you an idea of how service requirements and conditions differ from those outside of the service, I wish to cite the following case:

A short time ago a letter was received from a man of considerable reputation in the trade in which he suggested changing the size of Navy packages on drugs. His letter showed that he was a shrewd fellow and his arguments were certainly based on good sound sense. He reasoned this way: If a ship is given an allowance of acetphenetidin of say 16 1-ounce bottles, why not issue a 1-pound package, this would certainly reduce the amount of labor, material, and cost.

If you were to glance through the Navy's official list of medical supplies, you too would probably note that all drugs are carried in relatively small-size packages, and perhaps you would also wonder at the reason for this.

I will give you five reasons for the necessity of dividing the Navy drug stock in small-size packages:

(a) As a precautionary measure in the case of destruction of a part of the supplies carried on board ship.

(b) As a measure for the protection against deterioration of a large lot of material when kept in open packages for a long period particularly under varying climatic conditions.

(c) To have on board ship medical stores in divided lots in order to permit the immediate transfer of a part of such supplies to other commands in need of stores and away from the main source of supply.

(d) To place supplies on board ship in properly divided lots in order to permit the immediate fitting out of additional medical and surgical stations or outfits.

(e) In order to provide for the expeditious and convenient handling of the medical equipment within the space allotted to that purpose on board ships of all types.

I did not bring this case to your attention with a view to belittling anyone's effort, or in ridicule, but merely as an example illustrating our angle of reasoning in adapting our equipment for service afloat.

I have nothing to add to my remarks on divisions one and two in the testing department—specifications and blue-print divisions—I do, however, wish to say a few more words bearing on the activities in the laboratories of the testing department. These may be summarized as follows:

*Chemical laboratory.*—The chemical investigations include analyses on representative specimens taken from each delivery made on chemicals, drugs, and pharmaceuticals, including tablets and hypodermic tablets as well. This involves application of official tests of purity and such assay methods as are laid down in the



pharmacopoeia, or, in the case of non-official preparations, it involves the application of suitable tests of identity and purity to establish compliance with the accepted standard.

The chemical investigations also include analyses on metals employed in the manufacture of surgical instruments and other metallic appliances, such as monel metal tops for operating tables, the assay for silver content in certain appliances and suture wire; the composition of platinum alloys in certain types of hypodermic and intramuscular needles are also investigated. The composition of the several varieties of brass, bronze, and steels are also determined.

The laboratory also examines all steel-enameled ware, so-called agateware; these investigations involve tests for the detection of such metals as arsenic, antimony, lead, etc. The wearing qualities of the enameled surface is determined by the blast-test figures and the acid-test figures.

Complete chemical investigations are carried out on all rubber goods.

We also obtain chemical results on hospital cotton, surgical gauze, bandages, plasters, adhesive tape, etc. Chemical investigation on materials of that character involves such determination as the ether-extracted matter, chloroform-extracted matter, alcohol-extracted matter, water-extracted matter, the ash and its character, the reaction, and application of tests for the detection of makeweight and filler materials.

All volumetric solutions, and tests solutions of other standards, are prepared in the laboratory, each batch being carefully standardized.

All measuring apparatus for laboratory uses, such as pipettes, burettes, volumetric flasks, specific gravity bottles, and weights are calibrated in accordance with the methods laid down by the National Bureau of Standards.

*Investigations of the physical laboratory.*—This includes tests on gauze, hospital cotton, bandage material, sheets, blankets and other bedding material, surgeon's operating gowns, pajamas, flannel, and, in fact, textiles of almost every description which, in order to ascertain compliance with the Navy specifications, it is necessary to identify the character of weaving, to determine the tensile strength, the thread count, the determination of its weight per square yard, to test for shrinkage, if any, to identify the raw material employed. The waterproofing qualities and fastness of dyes in certain materials are also fully investigated.

The physical laboratory also investigates the physical properties of all rubber goods, such as hot-water bottles, rubber bandages, tubing, rubber sheeting, and special rubber surgical and dressing mate-

rials. The work on rubber involves the application of suitable tests to determine the tensile strength of the rubber, its ultimate elongation, its elasticity, its reduction in tensile strength, if any, when stretched to a definite degree, all these points being covered by definite requirements in the Government specifications.

The physical laboratory also undertakes complete standardization on all instruments of precision, such as sphygmomanometers and clinical thermometers being fully tested in accordance with the National Bureau of Standards methods.

All varieties of surgical suture material are fully investigated. This work involves determination of tensile strength of catgut, its elasticity, pliability, its boilability, and also its uniformity in size, and its sterility.

Suitable physical tests are also applied to all surgical and dental instruments, noting particularly the character of spring temper on such as haemostatic forceps, and carefully inspecting the edges and grinding surface of cutting instruments. All metal hypodermic syringes and glass syringes are tested. This involves hydraulic pressure tests, capacity, inspection of hypo needles under lens, etc., and gauging sizes of needles.

*Bacteriological laboratory.*—The bacteriological laboratory investigates the phenol coefficient of the several organic silver preparations and also disinfectant materials, and also investigates the sterility of certain products, such as suture material and emergency dressing kits.

My remarks concerning the duties of pharmacists in the medical supply depot cover the ground fully enough to give you a better understanding of the term material officer used in the early part of my address. The duties of the pharmacist acting as the material officer require him to make every effort to have on hand a safe amount of suitable stock, and also requires him to be thoroughly familiar with the quality of this stock, not through second-hand information or by judging of the reputation of a contractor, but on his personal investigation.

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## EXTRACTION OF TEETH.

By Dr. CHARLES A. GRIFFITH.

*What is meant by modern tooth extraction?*

By modern tooth extraction is meant the careful removal of offending teeth from the jaws with proper instruments and appliances under surgically clean conditions. This implies that only the minimum amount of pain be inflicted, that other teeth be not injured, that there be no unnecessary laceration and bruising of the soft tis-



sues, and that the patient be properly instructed concerning post-operative care to avoid excessive hemorrhage, pain, and possible infection.

*Do we pull teeth?*

No. It is very difficult to remove a tooth by simply pulling, and the danger of fracture is very much increased, as is also the chance of accident. A tooth should be removed by firmly grasping the neck with a proper pair of forceps, and exerting force in various directions, according to the location of the tooth in the arch, taking into account the anatomical structure of the parts involved. The periodontal attachment is thus broken, and the process sprung or slightly fractured, allowing the tooth to be lifted from the bony socket with little or no pull.

*What may be the indication for extraction?*

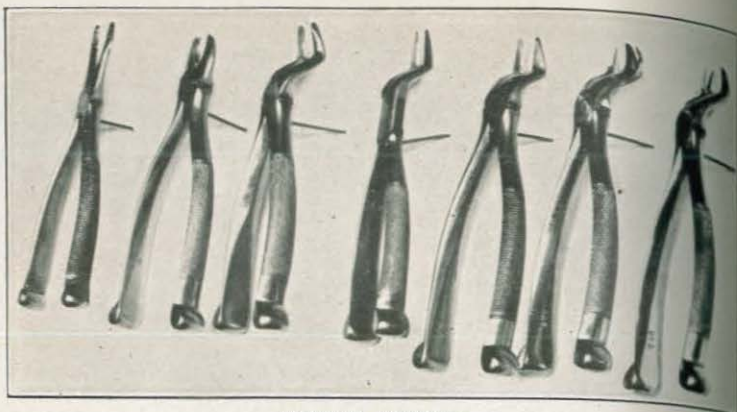
Extraction is indicated for those teeth that are diseased to such an extent that they will not respond to treatment in the attempt to restore them to health and usefulness. If they can not be put into such a state, they may act either as an irritant or a focus of infection to such an extent as to undermine the general health of the individual. In determining the advisability of extraction, various factors must be taken into consideration and weighed carefully. The following are perhaps the most common indications:

1. Decayed teeth which can not be made useful by filling or crowning.
2. Pulpless teeth, the possible foci of infection.
3. Abscessed teeth.
  - (a) Those which will not respond to treatment.
  - (b) Those which are the source of infection of the antrum of Highmore.
  - (c) Those having fistulae leading into nasal cavity, zygomatic fossae, neck, breast, or other remote parts.
  - (d) Those of acute type, having a tendency to point or break through the skin of the face or neck.
4. Impacted teeth if the possible cause of
  - (a) Neuralgia.
  - (b) Irritability to patient.
  - (c) Decay of other teeth.
  - (d) Irregularity of other teeth.
5. Teeth affected with pyorrhea to such an extent that they will not respond to treatment with desired results.
6. Teeth with fractured roots below neck of tooth.
7. Teeth with perforated roots or pulp chambers
  - (a) By accident.
  - (b) By decay.
8. Teeth that have to be devitalized before calcification of roots is completed.
9. Certain cases of supernumerary teeth.
10. Deciduous teeth interfering with eruption of permanent succeeding teeth.
11. Teeth considered useless in preparing mouth for reception of artificial denture.



USING THE LEG AS A BACK REST.

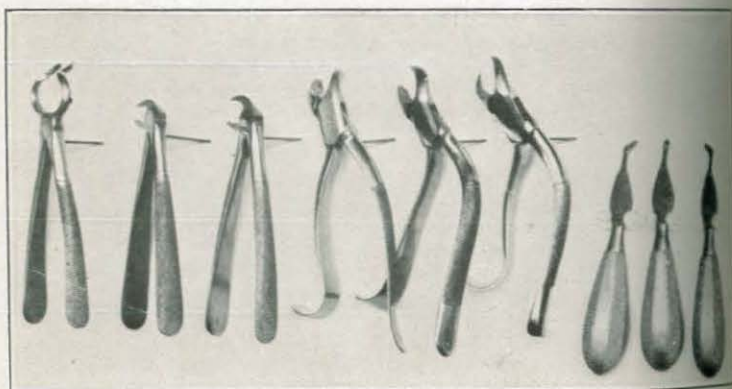




DENTAL FORCEPS.



DENTAL INSTRUMENTS READY FOR OPERATION.



DENTAL FORCEPS AND ELEVATORS.

12. Extruded teeth impinging upon gum of opposite jaw.
13. Certain teeth in the practice of orthodontia.
14. Teeth that by virtue of position, form, size, etc., are a constant irritant to the individual if unadvisable or impossible to correct otherwise.

*What is the technique to follow in applying forceps to a tooth and extracting same?*

The patient should be so placed as to get a good view of the parts and to allow proper access. The operator should be in such a position as will give him a good view, with free movement of his hands, arms, body, and legs, permitting him to apply his strength to the best advantage. The forceps are held in the right hand with the end of the handles in the palm, the fingers grasping the central portion of the handles in such a manner as to open and close them without cramping when force is applied. With the thumb and forefinger of the left hand the lips, tongue, and soft tissues are held aside, the beaks of the forceps steadied, guided to place, and guarded. The handles of the forceps are then brought together closing the beaks lightly about the neck of the tooth, and forcing them up beneath the gum and outside of the process a distance of about one-eighth of an inch. Now the fingers are shifted on the handles to firmly grasp the tooth and gradually increasing force is applied in various directions, depending upon the strength or weakness of the process, the amount of yield to the process, and the shape and size of the root, until the tooth is thoroughly loosened, when it is to be lifted out of the socket. The operator's eyes should be open to all that is going on, and always fixed upon the tooth, gum, process, forceps, and parts involved. He must also intensify his perception of the surroundings, being ever on the alert for the well-being and comfort of the patient, using extreme care not to pinch, bruise, lacerate, or otherwise injure other teeth, lips, or gums, until the tooth is removed from the mouth and placed upon the table.

*Does harm result from slight breaking or cutting of the alveolar process during the extraction?*

No. The process is a transitory structure. It develops at the time the teeth develop and disappears when the teeth are lost; therefore the cutting away of the alveolar crest while extracting does no more than nature herself does in the healing after extraction.

*Should the cuspid teeth erupting outside the arch line be extracted?*

Generally speaking, no. By extracting these teeth we cause a breach in the continuity of the arch, the process resorbs, and soon the teeth lose their support and shift in the direction of least resistance. This may cause lost function and deformity of the face and jaws, and predisposes to the disease known as pyorrhea alveolaris, with attending diseases.



*Mention accidents liable to occur during extraction that the operator should always be on the alert to avoid.*

1. Tooth falling into mouth and possibly being inhaled into trachea.
2. Other teeth loosened, broken, or dislodged.
3. Large amount of process fractured and coming out with tooth, such as the floor of the antrum of Highmore, the entire labial plate of upper or lingual plate of process on lower.
4. Fracture of maxilla or mandible.
5. Dislocation of mandible.
6. Laceration of gum tissue by adhering to neck of tooth.
7. Pinching of tongue, cheeks, or lips with beaks of forceps.
8. Abrasion and bruising of lips and cheeks with handles of forceps.
9. Breaking of hypodermic needle with loss of same in soft tissue while anesthetizing.

*Give treatment for above-mentioned accidents.*

1. If a tooth falls into the mouth, keep your eyes fixed on it, and turn patient's head at once to such a position that it will fall out of the mouth, or, immediately insert fingers, find and remove tooth. It may be necessary to use pharyngeal forceps or tweezers. In some instances or in extreme cases a tracheotomy may have to be performed to allow patient to breathe while the tooth is being located and removed from trachea.

2. In cases of loosened teeth, they should be splinted to place; if broken, the necessary restorations should be done; if dislodged, it may be advisable to reimplant and ligate to place.

3. Large fractured pieces of process should be dissected from the offending tooth, replaced, and stitched to hold firmly till reunion takes place.

4. Fractures are to be treated by approximation of parts and application of proper splints and bandages to hold parts firmly while healing.

5. Dislocation of mandible may be reduced by placing corks on molar teeth and applying force on point of chin in upward and backward direction, till condyles slip into place.

6. Lacerated gum tissue adhering to neck of tooth should be cut away with scissors or lance if slight, and if severe should be replaced and stitched.

7. Pinched tongue, lips, and cheeks should be cleaned thoroughly with peroxide of hydrogen and alcohol, afterwards painting with tincture of iodine.

8. Abrasion and bruising of lips or corners of mouth should be cleaned thoroughly, using peroxide of hydrogen, then alcohol, then some protective covering, such as vaseline or petrolatum or cold cream.

9. In cases of broken hypodermic needles, take X-rays, locate, make incision and remove if possible without too much injury to the soft parts.

*What untoward effects may follow extraction?*

A normal mouth presents the teeth in the form of an arch, each tooth in contact with its neighbors. When the force of mastication is brought to bear on any one tooth, part of this force is transmitted to other teeth by virtue of this contact. If this tooth is extracted for any reason, the neighboring teeth are brought into play, and, being unsupported on one contact point, they move in this direction, the line of least resistance. The crowns tend to meet by tipping of the teeth. This tipping movement allows other teeth to move for the same reason as the foregoing. All the teeth in the arch may thus shift.

Again, the tooth or teeth formerly antagonizing the extracted one will almost invariably extrude. The diameter of a tooth is greatest at the contact, making a sort of bell shape. When this tooth extrudes, the contact is lost, and the other teeth in the arch may move with the same outcome as in the case of the other jaw. Normally, a tooth is anchored to the process of the jaw by the periodontal membrane in such a manner that the maximum number of fibers function in mastication. If this tooth tips, the same force is brought to bear, but in such a direction on the periodontal fibers that only part resist the strain. The result is that the continued abnormal stress and strain on the few fibers sets up an inflammation in time, and some of the fibers break. Other fibers, not brought into use, degenerate. Pyorrhea alveolaris is thus given a foothold, and may affect all the teeth in the mouth.

The loss of a tooth may result, then in—

1. Unsightly appearance of the teeth and mouth.
2. Unclean mouth, by allowing foodstuffs to accumulate.
3. Decayed teeth from uncleanness.
4. Impaired function of mastication.
5. Inflammation of gums (gingivitis).
6. Pyorrhea alveolaris—
  - (a) Gastric and intestinal disorders.
  - (b) Lesions of heart, kidney, etc.
  - (c) Anemia.
7. Neuritis, rheumatism, etc.

*How may we minimize the untoward effects following extraction?*

By advising the patient to have restorations made to replace the lost organs. This restoration may be done more or less satisfactorily by means of proper fitting plates or bridges. The value of a plate or bridge, aside from assisting in mastication of food, lies in the support they may give to the remaining teeth of the arch, as well as offering resistance to the extrusion of teeth in the opposite jaw.



*Is it advisable to remove all the teeth of the mouth or jaw at one sitting?*

Generally speaking, no. Teeth, where such a diagnosis is made, are usually so badly affected by pyorrhea or apical infection that too much of the poison ferment or toxins would be liberated into the system at one time by such procedure. A better way would be to extract only one or two infected teeth at a time, at intervals of two or three days; thus we do not overload the system so much, but rather build up the patient's resistance so as to better combat the toxins liberated at subsequent sittings. This takes advantage of the inoculation of the system by bacteria of low virulence several times, and immunizes the tissues to their reaction—a vaccine treatment, as it were.

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### CONSTRUCTIVE CRITICISM.

The two articles, one by Pharmacist Heun and one by Pharmacist Eastman, will be of especial interest to pharmacists because they present ideas not entirely in accord with present bureau policies. They are welcome contributions, however, because they discuss these matters in the vein of constructive rather than destructive criticism. How easy it is to say, "The way things are done is all wrong," "I think this method is obsolete and should be changed." How difficult to present clearly without unpleasantness a method differing from the one in vogue. In offering constructive criticism it should always be remembered that slow growth and gradual change in existing system is sometimes better than a revolutionary change. These articles will interest pharmacists who are thinking out plans for and making improvements along clerical lines. If suggestions submitted to the SUPPLEMENT are not always adopted and put into use, it does not mean that the suggestions are poor nor does it mean that they have been entirely put aside. Discussions in the pages of the SUPPLEMENT will, it is hoped, keep alive the interest of pharmacists in clerical matters and lead to gradual improvements in existing methods as time goes by and as conditions change. (Editor.)

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### SUGGESTED CARD-INDEX SYSTEM TO REPLACE THE PRESENT BILL BOOK OF THE MEDICAL DEPARTMENT.

By E. E. HEUN, Pharmacist (T), U. S. N.

In presenting this suggestion no attempt is made to disturb the accounting system, the proposed changes being in details—the substitution of card index for book form.

The present bill book is taken as a guide, the various columns therein serving as column heads in the contemplated change. Where there is column-head duplication it serves as a cross index, the duplication being intentional for that reason. Thus each card acts as check on the others, making for absolute accuracy. The regulations, etc., governing the keeping of the bill book could apply to the card-index system, with such changes in detail as adaptations necessitate. The principle involved in the bill book, i. e., a uniform system of accounting, would be the same. The "Detailed instructions relating to the bill book," chapter 8, section 11, Manual of the Medical Department, could readily be changed to govern a card-index system.

A printed slip could be issued showing the various divisions, subdivisions, and subheads into which the card-index system is divided. This would conform to the columns of the present bill book. Thus each person to whom the keeping of the card-index system bill book would be intrusted would have constantly before him a guide by which to go. This slip would be attached to the file in which the cards are kept, making ready reference and consultation an easy matter.

The advantages of a card-index bill book are considered to be—

- (a) Economy: Total cost of binding and extra sheets of the present bill book being more than cost of cards and indices.
- (b) Space: The size of the present bill-book sheets is  $17\frac{1}{2}$  by 21 inches. The proposed system contemplates cards 4 by 6 inches.
- (c) Concentration: The cards of any particular group may be consulted without reference to any other part.
- (d) Accessibility: The file may be kept on any desk, the space occupied being so much less than the cumbersome bill book.
- (e) Elasticity: Any number of cards may be added without disturbance.

The system is divided into three grand divisions:

1. Requisitions and vouchers.
2. Appropriations.
3. Analysis of expenditures.

The requisitions and vouchers grand division consists of the cards filed under that grand division, the cards to contain the following information, listed in columns:

Requisition number; Date of requisition; Form used; Character of services or supplies; Voucher number; Date of voucher; Code-letter index; Name of payee; Appropriation; Analysis of Expenditures.

These cards are to be the master cards; all others must check with them, thus making the system a complete cross-index. The cards are to be numbered in sequence, as No. 1 is filled No. 2 is begun, etc.



The appropriations grand division consists of a subdivision for each appropriation:

Naval Hospital fund; Medical Department, U. S. N.; Contingent, M & S.; Bringing home remains, etc., Navy Department; Specific appropriations; Other than pertain to M. & S.

Each of the above subdivisions to have cards with the proper appropriation listed at the top, these cards to contain the following information, listed in columns: Requisition number; Voucher number; Code-letter index; Analysis of expenditures; Analysis of expenditures, subdivision; Analysis of expenditures, subhead; Amount.

The object of the columns analysis of expenditures, subdivision, and analysis of expenditures, subhead, is to provide for information necessary when the grand division, analysis of expenditures, is subdivided and subheaded, as for instance, in the case of "Hospital maintenance," and its subdivisions "Hospital supplies," "Ambulance service," etc., which are further subheaded. For instance, articles coming under the grand division analysis of expenditures as medicines, would appear in three columns, 1, under column "Analysis of expenditures," as "Hospital maintenance"; 2, under column "Analysis of expenditures, subdivision," as "Hospital supplies," and 3, under "Analysis of expenditures, subhead," as "Medicines, surgical dressings, etc." (or "Surgical instruments, etc.," or "Hospital appliances," in case they belonged to these classes).

The Analysis of Expenditures Grand Division consists of subdivisions as follows:

Land, buildings, permanent construction, etc.: Repairs to, and furniture for residences and other staff quarters; Care of insane, Pacific Coast; Hospital maintenance; Pay roll, civil establishment; Care of dead.

Each of the above subdivisions, or their subheads where such exist, to have cards with the proper Analysis of Expenditures, and subdivision (or subhead additional, if such exists), listed, these cards to contain the following information in columns:

Requisition number; Voucher number; Code-letter index; Appropriation; Amount; Authority for voucher.

The subdivision Hospital Maintenance is to be subheaded into:

Hospital Supplies; Ambulance Service; Power House; Other expenses under Hospital Maintenance.

Each of the above subheads under Hospital Maintenance to have cards with the necessary information in columns, cards under subhead to conform to the bill-book columns. These cards would be listed as follows:

Under hospital supplies cards for—

- (a) Medicines, surgical dressings, tablets, dispensary and laboratory equipment, disinfectants, etc.
- (b) Surgical instruments, etc.
- (c) Hospital appliances, etc.

Under ambulance service cards for—

- (a) Live stock, etc.
- (b) Provender, etc.

Under power house cards for—

- (a) Fuel.
- (b) Supplies, etc.

Under other expenses under hospital maintenance, cards for—

- (a) Culinary department.
- (b) Laundry.
- (c) Provisions.
- (d) Electricity, gas, water.
- (e) Stationery, books.
- (f) Bedding and linen.
- (g) Care of grounds, etc.
- (h) Hauling, tolls, etc.
- (i) Furniture and furnishings.
- (j) Ice and miscellaneous.

The subdivision pay roll, civil establishment, to have cards with the necessary information in columns, the cards to conform to present columns in bill book:

Under pay roll, civil establishment, cards for—

- (a) Ambulance service.
- (b) Culinary department.
- (c) Laundry.
- (d) Building and grounds.
- (e) Power house.
- (f) Others.

The subdivision care of dead to have cards with the necessary information in columns, the cards to conform to present columns in bill book:

Under care of dead, cards for—

- (a) Preparation, etc.
- (b) Transportation.
- (c) Care of cemeteries, etc.

Each card throughout the system will have entries at the top of the card which will clearly define its index place.

For instance, the card for power-house fuel would appear as follows:

Hospital maintenance:	Power house:	Fuel:	Card No. 1 (or 2, 3, etc.).
(Subdivision.)	(Subhead.)	(Detail.)	(Card Number.)



The cards for requisitions and vouchers would have entries as follows:

Requisitions and vouchers.

(Grand division.)

Card No. 1 (or 2, etc.).

(Card number.)

The cards for appropriations would appear thus:

Medical department (or contingent, etc.).

Card No. 1 (or 2, etc.).

(Grand division.)

(Card number.)

Thus it will be seen that three different sets of cards are necessary, in addition to the index and leads, one set for each grand division. Cards could be supplied printed, such places being left blank as details necessitate. However, most of the information required for proper indexing of card could be printed on it. The column headings could be printed on all the cards. Cards for requisitions and vouchers could be supplied ready for use; those for appropriations having blank space for appropriation; those for analysis of expenditures having blank spaces for subdivision, subhead, and detail.

Immediately under the entries on the top of the card would appear the column headings, and these could be printed on all cards according to details shown. Card numbers would be left blank, the printing being "Card No. —," the blank space being for insertion of the sequence number.

Index and lead cards could be supplied in sets or singly. The index and lead cards would be in accordance with the grand divisions, subdivisions, and subheads.

Indices and cards could be supplied as part of blank forms, to appear on request for blank forms as "bill book, indices, set," and "bill book, indices for ———," dotted line being for insertion of index desired, when an entire set is not wanted. The cards could be supplied as "bill-book cards for requisitions and vouchers," "bill-book cards for appropriations," and "bill-book cards for analysis of expenditures," the number of cards desired being inserted.

The size of the cards and indices should be 4 by 6 inches, a standard sized card for which files are constructed. The 4 by 6 inch space gives plenty of room for all entries without crowding, and is small enough to be compact and handy.

## PROPERTY ACCOUNTABILITY AND STOCK ACCOUNTING.

By E. C. EASTMAN, Lieutenant (T), Medical Corps, U. S. Navy.

This system necessitates the use of a "stock card," a "requisition book," a "property card," and a storeroom "ledger of expendable supplies." The requisition book is perhaps new and is intended to replace the accountability slip (Form 11). The property card is a

means of keeping the ward and department inventories up to date. This inventory will be made at least once a month and submitted to the property man, who will check it with the pages on his file, from the requisition book. If found to be correct, the pages from the requisition book are placed in a dead file. The inventory of a 50-department hospital could thus be checked in not more than three days. Any missing articles will be at once reported.

We will take each form and explain its use. The stock cards are kept in the storeroom and in alphabetical order, regardless of whether an item is a surgical instrument or belongs to the class "Hospital appliances, etc." Entries of receipts are made on these cards as soon as an article is received (the price may be entered later if not obtainable at the time), and across the item on the order, contract, or requisition, if no order or contract has as yet been received, is written "Stock" or "Entered." Referring to the sample, it will be seen that on 7-1-18, 36 cases, pocket, were in stock. This means in the storeroom. On the same day it is assumed that several wards were placed in commission, or an inventory was taken of the wards as a means of starting the system. On 7-2-18, there are 22 in stock, 14 being in use in the wards indicated. On 8-30-18, 12 were received on requisition, 2 were received from ward A for survey, and 2 from ward D for stock or issue (transfer) to some other ward, and 2 were issued to ward A. On 9-30-18, two were surveyed. We now have 46 on charge, of which 34 are in the storeroom, two in wards A, B, C, E, F, and G, respectively. If the question should arise as to whether a ward should have a certain item, or a certain number of any item, the history of that item in that ward can easily be determined from the stock card and the sheets in the ward requisition book of those dates.

The requisition book can be made similar to the stub requisition book used aboard ship. An original and carbon copy are to be made each time; the original to be torn out and kept on file by the property man. Every other page is to be perforated about 1 inch from the bound end so that it may easily be torn out. The leaves are to be numbered consecutively and each original sheet and the carbon following are to bear the same number. The cover of the book should be of cardboard or heavy paper and the letter of the ward or name of hospital department written thereon with ink; the pages to be lined and printed as per sample. When the articles are received, the sheet will be signed by the hospital corpsman detailed by the nurse or by the nurse herself. When articles are turned in, the property man will sign where indicated. Instructions should be printed on the inside of the cover. If "Can, irrigating" or "Irrigating can" is requested on this book, the property man will change it to "Irrigator,



steel porcelain." If "Trimmers, -6" are requested, he will change it to "Scissors, dispensary." In short, he will make the names of the articles on the book agree with the names on his stock cards. In this way, every article will be known by the same name in all places and actual inventory taking will be greatly facilitated. This book will be a permanent record in the ward, or department. This from this book the property cards will be posted. Each ward and department of the hospital is to have one of these books.

The property cards are very simple, but instructions could be printed on the back that they are to be kept posted from the requisition book. Each ward and department is to keep this card index of its property up to date.

No property should be transferred from one ward to another. It should be turned into stock and then issued to the other ward.

The storeroom ledger of expendable supplies is of the loose-leaf post-binder type. As will be noted, the space devoted to receipts is small compared to that for expenditures. The "price" column under "receipts" affords a means of easily determining at a glance how much money has been expended for any one item during any length of time. Each hospital department and ward will be given an account number. In this way it can easily be seen how much soap powder Ward A has used in eight weeks; how much starch the laundry has used; how much gauze or floor wax Ward C has used, etc. These sheets may be closed out and started again at any time, but it would not seem to be necessary until the sheet is filled, when it is taken out and placed in a "dead" binder. All expendable articles are to be entered in this ledger and the pages filed alphabetically. A danger mark may be established for each article, and the stock on hand should not run below this mark.

The advantages of the system are: Articles will be known by the same name in the wards and different departments and by the property man, as he should change the name of any article on the requisition book in case the nurse or head of a department has made a mistake. It is possible to locate the entire number of any one item at any time. When a ward makes a request for any item, the executive officer can see at a glance how many are already in the ward. The ward nurse and the property man both have a record of what has been issued to the ward. The ward property index will be consulted frequently. It is believed that in making up surveys the work will be greatly reduced if the "Unit cost" is entered on the "Stock card" instead of the total cost. The property man will know at any time just how much of an article, expendable or nonexpendable, he has on hand in the storeroom. There will be but one card for any one item instead of several cards for the same item filed

under different departments. For instance, "Rugs, 9 by 12," filed under nurses' quarters and the same under administration building.

If this system should be adopted, it would mean that Form D would be an alphabetical list of the hospital property instead of being classified into hospital departments as at present; but in property accountability what does it matter whether a "Pouch, Hospital Corps, large" belongs under "Surgical dressings" or "Dispensary furniture"? Many times cards for the same item are filed under different heads, depending upon who filed the card. The difficulty of keeping property cards properly filed has been especially noticeable during the last year, when it has been often necessary to have the entire office force composed of yeomen (female) or to have reserve yeomen or hospital corps men in charge of the storeroom who, perhaps, had never seen a hypodermic syringe and who did not know, nor could be expected to know, whether a transfusion outfit was a surgical instrument or a plumber's tool.

With each revision of Form B some one or several articles are changed from one class to another; but it is not thought best, nor even necessary, to change Form B or the method of preparing Form 4 requisitions on account of the great amount of work which would thus be entailed at supply depots, the confusion which would occur in making entries in the bill book, and because of the recent revision of Form B and the supply table.

ARTICLE: Gauze, 25-yd. rolls.

Danger mark: 500.

Receipts.				Expenditures.								
Date.	Reg. No.	Number.	Price.	Acct. No.	Number.	Date.	Acct. No.	Number.	Date.	Acct. No.	Number.	Date.
7-1-18	34	3,000	\$3,000.00	1	10	8-3-18	10	20	1-1-19	Br't fd.		
8-3-18	78	3,000	2,500.00	4	15	8-3-18						
				5	20	8-10-18						
				3	25	8-10-18						
		6,000										
		5,000										
12-3-18	Onhand	1,000										
	Carried forward			Total.	5,000		Total.			Total.	15,000	8-3-20





## ADVICE TO HOSPITAL CORPSMEN.

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### TIPS TO HOSPITAL CORPSMEN ON INDEPENDENT DUTY.

By GUY D. TABER, Pharmacist (T), U. S. Navy.

As the medical department has for sometime past, and more particularly since the United States entered the war, endeavored to fit the hospital corpsmen for duties independent of a medical officer, it has occurred to me that after about two years of service aboard one of our destroyers I might be able to give some of the younger men of the service a few ideas as to the kind of duty they will be detailed for after they become better fitted for performing the duties mentioned above.

You, as the individual representative of the medical department of your ship have a responsibility, not alone in the additional duties that will fall to your lot, but to your primary duty as the medical man of the ship. You will therefore find it necessary to bring forth the many instructions that you have received in the past and put them into operation. It will be necessary for you to use the utmost tact in dealing with men who are your shipmates. There will be times when your patience will be sorely tried; times when you may feel that the entire world is running backwards and that you are in the center of the storm, and these are occasions when you must use your common sense and good judgment in seeing a way through your difficulties.

You should at no time permit the crew to believe that you are not on the job. You must be ready for work from morning until night or all night should it be necessary. You must remember that your job is one which deals with human nature, and often you will find that you have a crew which may be excited to the highest tension should an accident occur. It is vital that at such a time you, of all men, keep a cool head. There will be times when various men will have any number of aches and ailments, from a toothache to the many known and unknown aches with which sea-faring men appear to be afflicted. Some of these aches and pains are really caused by the man being sick, some others are probably due to the imagination, but they all have their serious side, and it is your job to try and determine which side you have to prescribe for. You must listen to their troubles and try to get to the seat of the ailment and there are



many times when medicine is not necessary. A little talk with the man, a few questions and perhaps a suggestion or two will sometimes do more good than any amount of pills, provided, of course, that the trouble is of the mind and not of the body.

Altogether, it is a very bad policy to begin to serve out pills for all manner of aches and pains, though of course remedies have their place and in the proper way are very necessary. Everyone is familiar with the standing joke of the medical corps, that a man with a broken leg will get a pill as well as the man with a cold in the head, so in order to avoid that old time impression, try and ascertain the nature of any ailment before giving out medicine for it.

Of course you will have quite a little minor surgery in the nature of cuts, bruises, burns, and boils and these you must treat as well as your outfit will allow. Should any injury or sickness be serious, get your man to a medical officer as soon as possible. It is well to keep in mind the fact that while you are actually the only medical man on board your job does not permit you, nor is it expected, that you assume the responsibilities resting on a medical officer. You are the commanding officer's representative and there to attend to cases to the best of your ability and to request the proper medical assistance should you require it.

I don't suppose that ever before has the medical department of the Navy played such an important part as it has in this war. In the first place it was seriously handicapped at the beginning by lack of trained men, but due to the untiring efforts of the medical officers and of the older hospital corpsmen, the sudden influx of young men in the corps was met with well-equipped schools to teach them the rudiments of our profession. After a prescribed course there, these men were sent out to the general service, to ships, hospitals, and other duties and there they gained the much needed practical experience, a great many of them qualifying for independent duty very rapidly.

During the past two years, the men attached to vessels operating in the war zone have had a very good opportunity of coming in contact with work of all descriptions. At times when destroyers have picked up survivors there have been cases of exposure, gun-shot wounds, grippe, sore throat, some few cases of influenza or perhaps some contagious sickness. A man operating alone will soon find that such as the above will come under his notice and require his attention.

You will also find that you will have quite a little time on your hands should there be no sickness. I would suggest that you keep a copy of your Handy Book near by and study it at odd times. A still better idea would be to set aside a few minutes a day for study. You will find that you will be fully repaid when you take your next examination for promotion. You should not allow yourself to get into

a rut or be satisfied with your present rate, but should always keep trying for the job just ahead. The man who believes that he has finished or who does not care for advancement, but is content to remain in his present rate, is hardly suited to meet the present requirements of the medical department of the Navy.

## INDEPENDENT DUTY—PREPARATION OF SANITARY REPORTS.

Naval Instructions I 2127, 5222 (5d), Manual Medical Department 2574 and 2653 refer to the annual sanitary report, required by the Bureau of Medicine and Surgery from all ships on January 1.

On board vessels where hospital corpsmen are on duty independent of commissioned medical officers (doctors) the annual sanitary report is forwarded by the hospital corpsman. The interest and care with which many hospital corpsmen have prepared these annual reports is an indication of the efficiency with which most of them have been able to carry on the activities of the medical departments of these small craft.

There are here published three sanitary reports, one the annual report by a pharmacist's mate, first class, from a destroyer, and two from vessels of the Naval Overseas Transportation Service. These last reports are not required by the Naval Regulations, but they are required by the senior medical officer, N. O. T. S., Third Naval District. It is believed that hospital corpsmen will find these reports of interest in themselves and that they will give hospital corpsmen who may be called upon to serve independently of medical officers an idea of how such reports are written when required. (Editor.)

U. S. S. "COLHOUN,"

*Navy Yard, New York, N. Y., January 9, 1919.*

From: Medical officer.

To: Bureau of Medicine and Surgery.

Via Commanding officer.

Subject: Sanitary report—1918.

1. The *Colhoun* was commissioned June 13, 1918, at the Navy Yard, Boston, Mass., and was primarily intended to take on board a crew of 114 enlisted men, but exceeded that complement on account of war conditions, leaving Boston on her first trip with 130 men in a rather cramped state, as far as accommodations for the men were concerned.

2. Prior to leaving all men with any physical defects were transferred, even strict attention being paid to the teeth of all the personnel on board, as the duty for this vessel, oversea convoy work, was to be of a strenuous nature.



3. From the 30th of June to the 15th of September this vessel was continuously engaged in the oversea convoy work, with each trip east averaging 13 days in the "great circle" route, which necessarily meant sudden changes of temperature from damp, foggy periods of Newfoundland to the balmy changes in the Gulf Stream and the Azores and vice versa on the return voyage. These trips were most strenuous on account of the weather conditions, the vigilant watches kept through all kinds of exposure necessitated by war conditions, and only the most rugged could endure this; and with the engine rooms and firerooms being built with many defects, much trouble was encountered through breakdowns, and five men were taken from the engine room with heat exhaustion.

4. Considering all these conditions, only 50 men were admitted to the sick list, and these cases contained 20 men admitted for influenza while this vessel was at the navy yard, New York, during the epidemic. The influenza cases were isolated as much as possible and the men immediately transferred to the Naval Hospital, and as far as can be learned none of these cases resulted in death. Venereal diseases were uncommonly low; 5 cases of gonorrhea, 3 of which were chronic cases, were reported; also 1 case of chancroid. Prophylaxis was always convenient. Few have taken advantage of it, but an unusual number of men on board are married. No cowpox has been given, as all the men were vaccinated before coming on board. Twelve men were given the typhoid prophylaxis.

5. No deaths on board during this period, and no transfers of men in foreign ports.

6. The health of all officers was perfect.

7. This ship is of the latest type of destroyer. The crew is quartered in four compartments, two forward and two aft. The ward room is forward, also the chief petty officers' quarters forward of the ward room. In this case, it is considered that the quarters of the chief petty officers forward are unsanitary at sea, with all hatches and water-tight doors closed. As far as this fact is concerned all compartments at sea are rather close on account of all dogs being tightened on ports and all hatches closed, but the ward room door can be left open, and the inside ladders to the crew compartments are open, leaving vents to the bad and ventilator air, but in the chief petty officers' quarters there is absolutely no egress for the foul air, and this condition is considered one that eventually must be improved on, for the health of those obliged to sleep there in cold or bad weather.

8. One forward compartment quarters 20 men and has an air space of about 50 cubic feet; the other quarters 36 men with air space of about 100 cubic feet. One compartment aft quarters 36 men with air space of about 140 cubic feet, and the other quarters 20

men with air space of about 140 cubic feet. The chief petty officers' quarters have 10 men with an air space of about 300 cubic feet. The ventilation is good when in port and fair at sea in calm weather, but is very poor in rough weather when all precautions must be taken against admitting seas. Ventilation in all compartments provides fresh air, but is a one-way system, admitting air but providing no outlet for the foul air to be suctioned out. A system which would draw the air out of the compartments would be the only remedy.

9. Heat is supplied by steam radiators, and is adequate.

10. Water-closets, sanitary fittings, and urinals have been kept in very good sanitary condition. The wash room is very small but answers the needs very well and is separate from any part of the ship as is the crew's head. While in moderate weather these conditions answer well, in extremely cold weather it would cause much hardship on men to have to pass on open deck to these places, but in view of the sanitary conditions through the head and wash room being on the open deck it is considered that the sanitary condition is the primary object and the hardships secondary in the upkeep of the ship.

11. The crew's ration is adequate in quantity and the quality, considering the long trips, has been very satisfactory. The messes are kept in excellent condition, the food being brought down in closed containers from the galley and served hot. There have been all varieties of foodstuffs, and soup is prepared about every other day. In the escort trips, this vessel oiled about every sixth or seventh day, and fresh meat and bread was transferred from the transport oiling us, and this helped in the quality of the food which on these types of vessels on long trips makes canned food and hard tack instead of bread a necessity, but in the most part canned food and hard tack were used as little as possible.

12. The ice machine is rather inadequate for long trips in warm weather, but with the aid of transfers from transports, this vessel was able to make the ice machine on board suitable for the keeping of fresh meat and maintaining drinking water at a drinking temperature.

13. The galley is situated on the open deck amidships, near ice machine, and is convenient for both the deck and engineer force.

14. The clothing on board is suitable for all weather conditions, the Navy type of sheepskin clothing and heavy underwear being issued to all men standing watches exposed.

15. The medical supplies on board are considered adequate and of good quality and while the sick bay is necessarily small and cramped, it serves the purpose on this type of vessel.



16. The battle dressing station is the ward room and is directly under the bridge, a very convenient location. Three men as stretch-bearers and a man with knowledge of first aid man the dressing station at general quarters.

17. As all men transferred to destroyers are men with seagoing qualities, the number of sick is materially reduced, but as so many vessels of this type are being built it is difficult to secure experienced men throughout, and it is considered that in the future more than one hospital corpsman will be required in ship's complement to insure that at least one hospital corpsman is on board at all times to handle emergency cases. (H. N. Trotter, Ph. M. 1, U. S. N.)

U. S. S. "BEUKELSDIJK," November 27, 1918.

From: Pharmacist's mate.

To: Bureau of Medicine and Surgery.

Via: Commanding officer.

And: Medical aide N. O. T. S.

Subject: Diseases on board this ship during trip of August 3, 1918, November 23, 1918.

1. This ship left New York on August 3 and after an uneventful voyage arrived in Brest, France, on August 24. Shore liberty was given officers and crew every day while in this port up to and including September 8 when all liberty was stopped. No sickness of note developed while in this port. Additional medical supplies were procured on requisition from Base Hospital No. 5, Medical Supply Depot. On September 21 the ship left Brest and arrived with all on board in good health, at St. Nazaire, France, on September 22.

2. In this port officers and crew were given shore liberty every day up to October 3, when the ship was unmoored from the dock and was moored to the S. S. *Erny*. On this date one man complained of having pains in his joints, a lame back and a headache, and upon taking his temperature it was found to register 100.2 F. He was put to bed and given the following treatment: Calomel, grains two (given in  $\frac{1}{2}$  grain doses every half hour) followed in three hours by magnesium sulphate, one ounce; sodium salicylate, and sodium bicarbonate, grains 15 each, every three hours. On October 4, between morning and evening, seven more men and one officer began to complain of the same symptoms and were given the same treatment. The port naval medical officer was called and pronounced the disease "Spanish influenza," and ordered the eight men and one officer transferred to the United States Army Base Hospital No. 101.

3. On October 5 the ship sailed from St. Nazaire and anchored in Quiberon Bay for the night. During the day three more men were

taken sick with the disease and during that night two others were taken sick.

At 4 a. m. October 6 it was decided to put back into St. Nazaire where the services of a naval medical officer could be had. The ship arrived at that port at 10 a. m., and as one of the patients had a temperature of 105 F. a boat was sent ashore for the medical officer at once. He came aboard at 4 p. m. and ordered calomel, salts, and salicylates as before for all of the patients. On account of the Army hospital being overcrowded it was impossible to transfer any men off the ship, therefore the starboard side of the forecabin was condemned and used for isolation. On October 7 two new cases were admitted and on October 8 two more men and one officer were admitted. October 9 no new cases developed and one man was discharged from the sick list. October 10 two new cases were admitted and isolated, and seven men and one officer were transferred to the United States Army Base Hospital No. 101 as per the medical officer's orders. Two of the men who were transferred to the hospital on October 4 returned to the ship this date. One new case was admitted and isolated on October 11 and one man returned from the hospital. Two of the cases kept on board were discharged from the sick list this date leaving three men still sick on board. October 12 the forecabin deck, bunks, and bulkheads were scrubbed down with a solution of cresol and the sick bay was given a thorough cleaning with the same solution.

4. October 13 the ship was inspected by the port naval officer and the medical officer and the ship was ordered to proceed to Quiberon Bay. While anchored in Quiberon Bay six men and one officer returned from the hospital, the three cases which had been kept on board were discharged from the sick list, and no new cases developed. The ship left Quiberon Bay October 20 and arrived in New York, after numerous delays, with all hands on board in good health. (R. J. Arkley, Ph. M. 2, U. S. N.)

#### MEDICAL DEPARTMENT,

*U. S. S. "Wakulla," November 29, 1918.*

From: William Meehan, Chief Pharmacist's Mate, U. S. N. R. F.

To: Medical Aide, N. O. T. S., New York, N. Y. (via commanding officer).

Subject: Report of trip.

1. Left New York, N. Y., at 10 a. m., September 7, 1918, bound for Archangel, Russia.

2. Crew comprised 14 commissioned officers and 74 enlisted men.

3. While outbound, in the north Atlantic, a severe storm was encountered, which caused considerable damage to the ship, and



we were forced to desist from original schedule and put in at Dublin, Ireland, where cargo was discharged and some repairs made. During voyage across the Atlantic, numerous minor injuries occurred among the crew, mostly among the deck force, which were promptly and effectively treated. We lay in Dublin for 21 days, during which time a serious epidemic of influenza broke out in the city, and despite all efforts made to protect the crew against this disease, by restricting shore liberty, spraying the throats of entire crew daily with a hot solution of potassium permanganate, (1-4,000) and keeping the men on deck as much as possible in the open air, unfortunately, the disease broke out aboard in a very severe form and involving all departments of the ship (with the exception of the medical), and on arriving at Liverpool, England, five days after the first case appeared, not less than 24 men were down with the disease, making any attempt at isolation aboard ship almost impossible. On arriving at Liverpool, the commanding officer promptly communicated with the United States naval authorities at that port, and Lieutenant Thomas L. Sutton, Med. Corps, U. S. Navy, responded promptly and took charge of the sick, and the following day arrangements were made with the American Red Cross Hospital for their care and treatment. The patients were transferred by ambulances furnished by the United States Army. The very sick ones were placed on litters, while those who were considered able were allowed to sit up in the ambulances. Thirteen cases developed while in Liverpool, bringing the total up to 37. All recovered and were able to rejoin ship before leaving Liverpool, with the exception of 4, and these were transferred to the United States Receiving Ship, at Liverpool. Crew's quarters were thoroughly disinfected and painted, and all clothing and bedding thoroughly sunned and aired, and every precaution was taken to prevent the spread of the disease. Ten cases of venereal disease developed during the trip. These cases were promptly restricted and put on active treatment, and those showing active symptoms of disease on arriving in this port, were transferred promptly to the United States Naval Hospital.

4. Left Liverpool, England, 1.20 p. m., November 9, and arrived at New York, N. Y., 1.05 p. m., November 25, 1918. Homeward trip uneventful, nothing occurring worthy of note.

WILLIAM MEEHAN.

[First indorsement.]

U. S. S. "WAKULLA," November 30, 1918.

From: Commanding Officer.

To: Medical Aide, N. O. T. S., New York, N. Y.

1. Forwarded.

D. S. HEATH.

## SUGGESTIONS REGARDING THE METRIC SYSTEM.

By CHARLES W. RODGERS, Lieutenant (J. G.), Dental Corps, U. S. N. R. F.

During a course of instruction in materia medica presented to the officers of the dental corps in the Navy Dental School at the Great Lakes Naval Training Station, the author brought out some suggestions which are probably new and which may be of value to the medical service.

The first suggestion is a simple "rule" for making saturated solutions of a "salt" of any kind in water.

The rule is: Divide the amount required by the solubility of the salt.

*Example:* To make 30 mls of a saturated solution of boracic acid proceed thus:

Amount required. Solubility of boracic acid.

30 divided by 18=1.666 gms.

Take 1.666 gm. and add water sufficient to make 30 mls.

R	Gm.
Acidi boracici.	1.666
Aquae. qs. ad.	30.
M.	
Sig. -----	

The use of this rule will simplify the making of saturated solutions. It has been tried out in a practical way, at my request, by several of the pharmacists on the station and seems to be perfectly accurate. The application of this rule implies the use of the metric system. The other suggestion pertains to the vocabulary of the metric system. In the recent past, when the words cubic centimeter were used to express what is now known as a mil, it was extremely cumbersome to express vocally any fractional part of the cubic centimeter. Such expressions as: Cc. .5, one-half cubic centimeter, or Cc. .570, fifty-seven hundredths of a cubic centimeter, etc., were almost universally used. There was a lack of harmony with the other metric forms of deci, centi, and milli.

For another reason the Committee on Revision of the latest U.S.P. dropped the words cubic centimeter from the vocabulary of the Ninth Decennial Revision, official from September 1, 1916.

The committee offers the following explanation regarding the dropping of the words cubic centimeter and the adoption of the word mil instead:

"Mils v. Cc. The term cubic centimeter has been replaced by the word mil. The United States Bureau of Standards declared that the term cubic centimeter was a misnomer, there being a slight



difference between the thousandth part of a liter and the cubic centimeter, as one liter was determined to be equivalent to 1.00027 cubic decimeters.

"The Committee of Revision decided that the time had come to adopt the word mil, the first three letters of the whole word milliliter.

"In addition, the change promotes international uniformity in the two pharmacopoeias published in the English language."

Since the adoption of the term mil it has occurred to me that there is an opportunity of expressing (by voice) the decimal fractions of a mil easily and in conformity with the established terminology of the metric system—

Thus: 1. One mil.  
       .1 One decimil.  
       .01 One centimil.  
       .001 One millimil.

Even though this suggestion does not meet with universal favor, the medical and dental practitioner, as well as the pharmacist will find the suggested terminology helpful in speaking or thinking of decimal fractions of a mil.

Again, when converting from the apothecary's measure to the metric equivalent, particularly if the amount to be converted is represented in minims, the adoption of the suggestion will simplify the translation. Even with the adoption of the word mil, the usual interpretation of the metric equivalent of the minim has been as follows:

1 minim = .06 Six one-hundredths of a mil.  
 2 minims = .12 Twelve-hundredths of a mil.  
 10 minims = .62 Sixty-two-hundredths of a mil.  
 16 minims = 1. One mil.

If the above cumbersome expressions are compared with the simplicity, harmony, and advantages of the following:

1 minim = .06 Six centimils.  
 2 minims = .12 Twelve centimils.  
 10 minims = .62 Sixty-two centimils.  
 16 minims = 1. One mil.

the author feels sure that the suggested use of the terminations decimil, centimil, and millimil will be favorably received.

## PRACTICAL SUGGESTIONS.

### RECLAMATION OF SURGICAL GAUZE.

By O. G. RUGE, Lieutenant (T), Medical Corps, U. S. Navy.

Several requests have been submitted to the bureau recently for the purchase of gauze washing machines. The information given below is published for those interested in this question, as well as with a view to testing the procedure outlined in a practical way and to ascertain whether the conservation of surgical gauze may be thus economically effected.

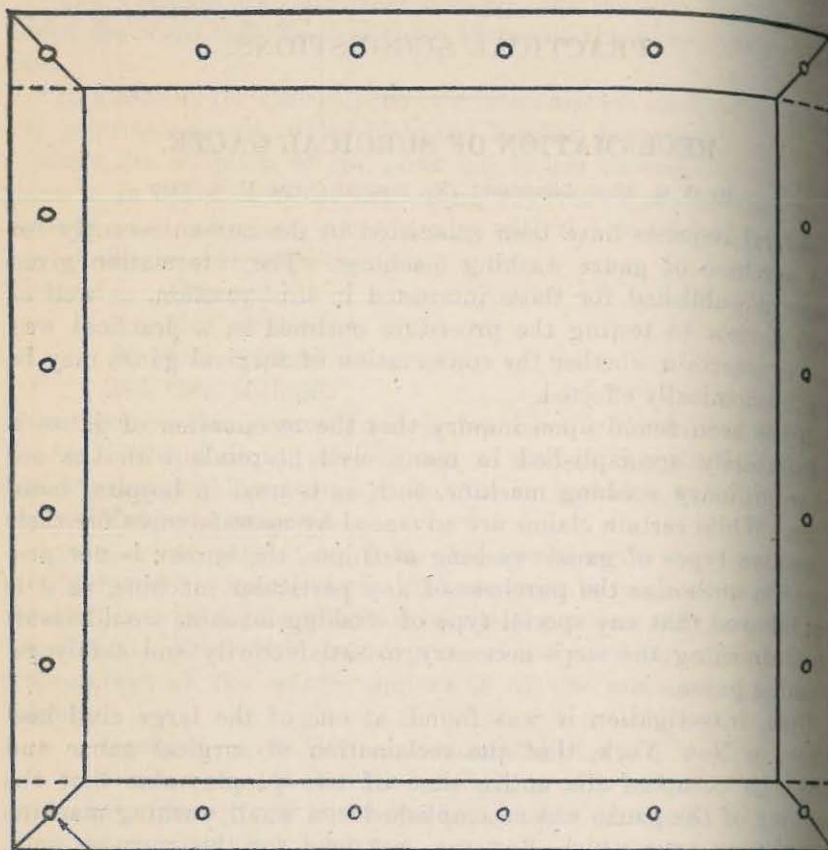
It has been found upon inquiry that the reclamation of gauze is satisfactorily accomplished in many civil hospitals with the aid of an ordinary washing machine, such as is used in hospital laundries. While certain claims are advanced by manufactures for their respective types of gauze washing machines, the bureau is not prepared to authorize the purchase of any particular machine, as it is not believed that any special type of washing machine would result in diminishing the steps necessary to satisfactorily and safely reclaiming gauze.

Upon investigation it was found, at one of the large civil hospitals in New York, that the reclamation of surgical gauze and dressings occupied the entire time of two people; also that the washing of the gauze was accomplished in a small washing machine of ordinary type which, however, was used for this purpose only. The hospital in question kindly furnished the bureau with the following instructions for washing gauze, which appear, from material that had been recovered two or three times, to give excellent results:

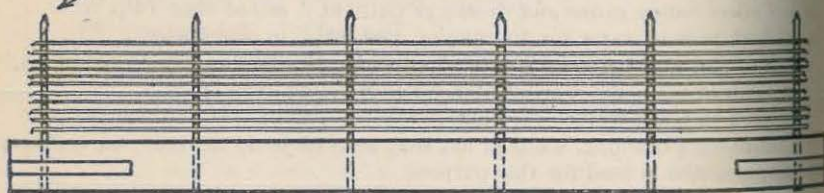
- (a) Collect soiled gauze and dressings daily at a stated time (4 p. m.).
- (b) Soak in cold water for 10 minutes, then rinse in cold water.
- (c) Soak in mild lukewarm soda solution for 10 minutes, then rinse.
- (d) Soak in plain lukewarm water for 10 minutes, then rinse.
- (e) Soak in plain water overnight.
- (f) Following morning, wash in hot soap suds 25 to 30 minutes; an ordinary washing machine is used for this purpose.
- (g) Three hot rinsings.
- (h) One cold rinsing.
- (i) Water extracted for 10 minutes (centrifugal machine).
- (j) Gauze stretched on frames and dried.
- (k) Remove from frames, fold, and sterilize.



*GAUZE FRAME - TO BE OF SUITABLE DIMENSIONS  
TO ACCOMODATE STANDARD PIECES OF GAUZE*



*WIRE NAILS SET IN FRAME  
OF PINE LUMBER.*



*FRAME SHOWING GAUZE IN PLACE -  
THICKNESS OF GAUZE EXAGGERATED.*





The first column gives a fair standard of weight for height required of persons being examined for commissions in the Navy or Marine Corps. The second gives the average weight for height

## Prest-O-Lite Gas Tank And equipment suitable for dispensary work aboard ship.



Style 'E' Prest-O-Lite.

..COST.  
Estimated cost of  
Complete equipment  
\$30.

Description  
Style 'E' Prest-O-Lite - 6 inches in  
diameter; contains approxi-  
mately 30 cubic feet of gas;  
approximate weight, 25 lbs;  
approximately 120 hrs., con-  
tinuous burning.

### Accessories

Union for tank



Gas hot plate



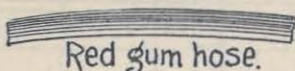
Band for tank



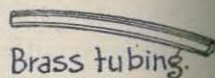
Key to tank.



Vessel holder.



Red gum hose.



Brass tubing.

JDN

less the variation of 15 pounds allowed. As the minimum weight for officers is fixed at 132 pounds, the chart does not run below that point. Column three gives the average mean chest circumference

required for height and weight. The 1-inch variation allowed below the standard is not given, because of the simplicity of mentally deducting the 1 inch from the mean circumference when the candidate is sufficiently vigorous and healthy.

With the chart hanging at a convenient height back of the scales it is a simple matter for the examiner to compare the reading on the measuring rod with the graduated edge on the chart and to ascertain the required minimum at a glance. For example, if an applicant measuring 71 inches and weighing 145 pounds, having a mean chest circumference of  $34\frac{1}{2}$  inches is being examined, the examiner by consulting the chart can see that the candidate is deficient in mean chest circumference by one-half inch, and that he is 2 pounds under the minimum weight for height.

A piece of wood 3 by 12 inches, one-half inch in thickness, and a piece of adding-machine paper, or a strip  $2\frac{3}{8}$  inches wide is all that is required. For a recruiting station where minors are examined a chart with a wider range, but conforming to the naval standard for such applicants, can be improvised in a similar manner.

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## A HANDY SOURCE OF HEAT ABOARD SHIP.

By P. F. DICKENS, Lieutenant, Med. Corps, U. S. Navy.

The "Prest-O-Lite" apparatus, shown in the accompanying illustration, is a compact, convenient, and cheap source of heat which is considered practicable for use in the dispensary on board ship and in the laboratory on hospital ships particularly, where the constant need is felt for a high heat in the form of an open flame. The apparatus carries with it both a stove and Bunsen burner which may be utilized for a variety of purposes some of which are here mentioned.

In preparing special diets as cocoa and soups; in laboratory work, chemical and pharmaceutical operations as the making of drinking tubes, and pipettes for the Noguchi test; in liquifying phenol, the manufacture of ointments, preparation of culture media, urinalysis, and fusion work in dental laboratory. During battle practice when the electricity aboard ship is used entirely for operating implements of war, it may be used for boiling water and sterilizing instruments.

The outfit complete costs, when new, \$30. The tank holds approximately 30 cubic feet of gas, being sufficient for 120 hours continuous burning. The refilling of the tank costs \$1.50.



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## CLIPPINGS.

### BIOLOGICAL PRODUCTS FOR PHARMACISTS.

By R. P. FISCHER. (From the Pharmaceutical Era, October, 1918.)

#### RECENT ADVANCES IN BACTERIOLOGY.

The sciences of bacteriology and immunology are making such rapid strides that few physicians are able to keep abreast of the most recent advances. They have learned to turn to the pharmacist for information on various drug products. Why should they not also turn to him for information on biologicals? Many drug-store proprietors who are unable to give this department of the business the attention it demands designate one of their clerks to make a study of the subject and thus have someone ready to supply the information when it is asked for. Colleges of pharmacy are now giving special courses in bacteriology which fit their graduates to keep in step with the rapid progress being made in this science. A great deal of literature from various manufacturing houses is available on the newer products and this can be used to advantage by the pharmacist in connection with letters sent to physicians periodically advertising the biological department of the store.

When most of us speak of biological products we immediately think of smallpox vaccine and diphtheria and tetanus antitoxins, and our study of the subject is limited to these products probably because they are the only ones recognized in the Pharmacopoeia and are the ones mostly discussed in textbooks. We all know something about the manufacture of diphtheria antitoxin and smallpox vaccine, and the general tendency is to classify all bacteriological products along with the two mentioned. The object of this paper is to outline briefly some information regarding other serums, vaccines, and bacterial vaccines, that will be useful to the retail druggist particularly if he caters to business along this line.

#### SERUMS NOT VACCINES.

One often hears physicians and pharmacists speak of "those vaccines" or "those serums," including in these terms the entire list of bacteriological products that are used in the treatment of disease, and it is not uncommon to hear the terms "vaccine" and "serum" used interchangeably without any apparent regard for their meanings. It should be borne in mind, therefore, that a serum is a product



obtained by injecting horses or other domestic animals with toxins or bacteria in increasing amounts until the blood of the animal contains a sufficient number of antibodies to combat the disease and then bleeding and separating the serum that contains the antibodies from the solid portion of the blood.

In this connection, we should distinguish between antitoxin serums and antibacterial serums. The two serums recognized in the Pharmacopoeia are antidiphtheritic serum and antitetanic serum. Both are antitoxic serums and have been popularly known as diphtheria antitoxin and tetanus antitoxin. They are prepared by injecting horses, not with the bacteria causing diphtheria or tetanus, but with the toxins generated by these bacteria. Antistreptococcic serum and antipneumococcic serum are examples of antibacterial serums, because in those cases the organisms causing the infections are injected into horses in order to produce the antibacterial serums. In the case of tetanus and diphtheria, the antitoxin can be separated from the serum by precipitation with the proper chemicals and the precipitated antitoxin is redissolved in physiological saline solution and standardized. In this way a considerable quantity of antitoxin can be concentrated into a very small bulk. In the case of antibacterial serums, the finished product is the blood serum itself.

The term "vaccine" refers to a living organism or virus used to produce a mild form of the disease, in that way stimulating the inoculated person or animal to produce antibodies and thus ward off infection. Smallpox vaccine and rabies vaccine are examples of vaccines. Quite a large group of products spoken of as vaccines are really not vaccines in the strict sense of the term, because they do not represent living germs. Among bacteriologists, they are known as bacterial vaccines or bacterins, consisting of suspensions of killed bacteria in physiological saline solution; and, when injected, they stimulate the mechanism of immunity to produce sufficient antibodies to ward off attacks of these organisms.

#### BACTERIAL VACCINES.

Bacterial vaccines, or bacterins, are by far the most numerous of the bacteriological products on the market, and their use is being attended with considerable success. Prophylaxis against typhoid infection, respiratory infections such as common colds, meningitis, whooping cough, etc., is produced by the use of bacterial vaccines.

An improvement over the ordinary type of bacterin is the serobacterin or sensitized bacterial vaccine originated by Besredka, of the Pasteur Institute of Paris. Serobacterins differ from plain bacterins in that they have been treated with specific immune serum and bring about a quicker immunizing response. To illustrate: The

difference between typho-bacterin and typho-serobacterin is that typho-bacterin is merely a standardized suspension of killed typhoid organisms in physiological salt solution; whereas, typho-serobacterin is a standardized suspension of killed typhoid bacilli which has been sensitized by treatment with a serum prepared by injecting animals with typhoid organisms. This sensitization has the effect of reducing the local reaction that accompanies injection of bacterial vaccines and preventing severe general reactions which are sometimes caused by plain bacterins. Furthermore, the immunizing effect, when serobacterins are used, is almost immediate, manifesting itself within 24 to 48 hours; whereas, in the case of bacterins several days are required to elicit any immunizing response.

#### BIOLOGICAL PRODUCTS IN THE PRESENT WAR.

The present war has brought out many important things in the scientific world. Among the most important, if not the most important, are the facts which are being made known regarding the specific effect of some of the biological products which have been in use for a number of years. When the war began, neither side was prepared for the many cases of tetanus which developed in northern France, due to the condition of the soil, which had been highly cultivated for many years. Tetanus organisms abounded there, and from 10 per cent to 12 per cent of the wounded developed tetanus, and 90 per cent of these died of the disease. It did not take long to stop these enormous losses by the prompt use of tetanus antitoxin. It has been customary in the allied armies to give every wounded soldier an injection of 500 units of tetanus antitoxin at the first opportunity, followed by three other injections of 500 units each at intervals of a week, so that 20,000 units are injected over a period of four weeks. Our own boys received two injections of 1,500 units each, the first injection being given immediately after the wounded soldier is brought to the first-aid station, and the other injection a week or two later. Injections of 1,500 units can readily be made because of the highly concentrated serum that is being supplied from American sources. By precipitating the antitoxic substance and redissolving it in physiological salt solution and standardizing, 1,500 units can be concentrated into as small a bulk as 5 mils and, of course, the injection of so small a bulk presents no difficulties.

Another serious infection to which the wounded soldier is exposed is gas gangrene. It has been proved conclusively that gas gangrene is produced by the bacillus *Welchii*, named for Professor Welch, of John Hopkins University, who discovered the organism. The effects of this bacillus are due to the toxin which it generates. It has been proved possible to prepare an antitoxic serum which will combat in-



fections of this organism; in other words, gas gangrene is being combated in the same way as tetanus or diphtheria, both of which are due to the formation of toxins and for both of which there are antitoxic serums. A so-called "dual purpose" serum is now being prepared which contains in the small bulk of 10 mils, 1,500 units of tetanus antitoxin and 10 units (American standard) of gas gangrene antitoxin. This is the first protective dose administered to wounded soldiers to prevent lockjaw and gas gangrene.

#### PREVENTION OF TYPHOID INFECTIONS.

Typhoid has been eliminated in our armies by prophylactic vaccination. In the Spanish-American War we lost 2,744 men from typhoid alone. If the same percentage were to become infected with the disease during the present war our casualty list up to April 1, 1918, would number more than 217,000 from this disease alone. All this has been avoided by the simple expedient of injecting each man with the triple typhoid bacterin sometimes referred to as "triple vaccine," beginning immediately after arrival at army camps and cantonments. The "mixed typho-bacterin," or "triple vaccine," mentioned, is made up of killed typhoid and paratyphoid A and B bacilli. The mixed vaccine is used because it was found that many men who had been immunized against typhoid fever later contracted paratyphoid fever caused by either the paratyphoid A or B organism. The so-called "triple vaccine" includes all three organisms and affords protection against them. Even including those cases where the men go to camp with the typhoid bacillus incubating in them—in every 100,000 there must always be some such "carriers"—the deaths to date in this war from typhoid number only eight, while as yet there has been no case whatever of ill effects resulting from the inoculation itself. In the French army the monthly typhoid mortality is now less than 3 per 1,000,000.

It is obvious that if every person outside of the army could be induced to submit to the same prophylactic vaccination against typhoid, the disease would just as quickly disappear from civil life.

#### SENSITIVENESS OF SHAKING-OUT METHOD IN ALKALOID EXTRACTION.

No published data appear to be available as to the limit for the usual alkaloidal reactions on the extracts obtained by shaking out an extremely dilute, alkaline, aqueous solution of a free alkaloid with an immiscible solvent. Experiments were made with 200 mils of water, containing various minute quantities of alkaloids. This was

rendered alkaline with 0.5 grams of anhydrous sodium carbonate, and shaken out with 10, then 5, mls of chloroform. The bulked chloroform extract was evaporated, and the residue taken up in 1 mil of sulphuric acid 1: 10. The acid liquid was divided into three watch glasses. To one of these a drop of Bouchardat's reagent was added; to the second, a similar quantity of Tanret's reagent; and to the third, of Sonnenschein's alkaloidal precipitant. In the first two an almost immediate opalescence or precipitate, and in the third, an ultimate amorphous precipitate indicated the presence of an alkaloid. Under these conditions the presence of 0.0001 gm. of alkaloid in the 200 mls of water, or 1: 2,000,000, could be readily detected. This was not the limit of sensibility. With the reagents above named, it was at least three times greater than above indicated. In the case of aconitine, a positive green reaction was obtained from a dilution of 1: 4,000,000. For the ordinary detection of alkaloids in water, therefore, reliable results may be obtained by testing as little as 100 mls of the original sample. This has been proved to be the case with aconitine, atropine, brucine, cocaine; colchicine; eserine, pilocarpine, strichnine, veratrine and conine; in fact, all the commoner toxic vegetable bases. Under these conditions, stagnant water and well water containing putrefying organic matter gave no positive reaction for alkaloids (*Comptes rendues*, through *Pharm. Jour.*). (Reprinted from The Pharmaceutical Era, October, 1918.)

## REMOVING STAINS OF COLLOIDAL SILVER.

Discolorations produced by solutions of argyrol, silvol, and other proteid silver salts, can be removed from linens by immersing the stains in an aqueous solution of 1:500 bichloride of mercury. If the stains still persist, the discolored cloth should be immersed in a hot 1:500 aqueous solution of bichloride of mercury and then washed with soap and water.

## FOR X-RAY WORK.

Barium sulphate is one of the most insoluble chemicals known, and on this account it has come into very extensive use in X-ray work, particularly when photographs of the stomach and intestines are desired. When the barium sulphate is administered to the patient, it coats the gastrointestinal tract, and any malformation or enlargement of the stomach and intestines will be plainly indicated on the X-ray plates. It is highly important that the barium sulphate be free from any soluble salts of this element, thus avoiding any possibility of poisoning. (Pharmaceutical Era, October, 1918.)



## TOXICITY OF MERCURIC CHLORIDE.

Sansum, following a study made upon the administration of mercuric chloride to dogs, concluded that when 4 mg, or more of the salt per kilogram of body weight has entered the tissues at large, death regularly occurs, and that we have no adequate grounds for believing that death is preventable by any known form of treatment. Whereas subsequent studies may add to our knowledge, it would appear that persons who have recovered from mercuric chloride poisoning owe their lives to the fact that a lethal dose has never gained access to the extraportal circulation. Practical therapeutic efforts should be directed frankly toward the accomplishment of two things: 1, Mechanical removal of the poison from the lumen of the alimentary tract. 2, Antidoting the poison before it leaves the portal circulation—that is particularly before absorption. (Jour Am. Med. Assn.)

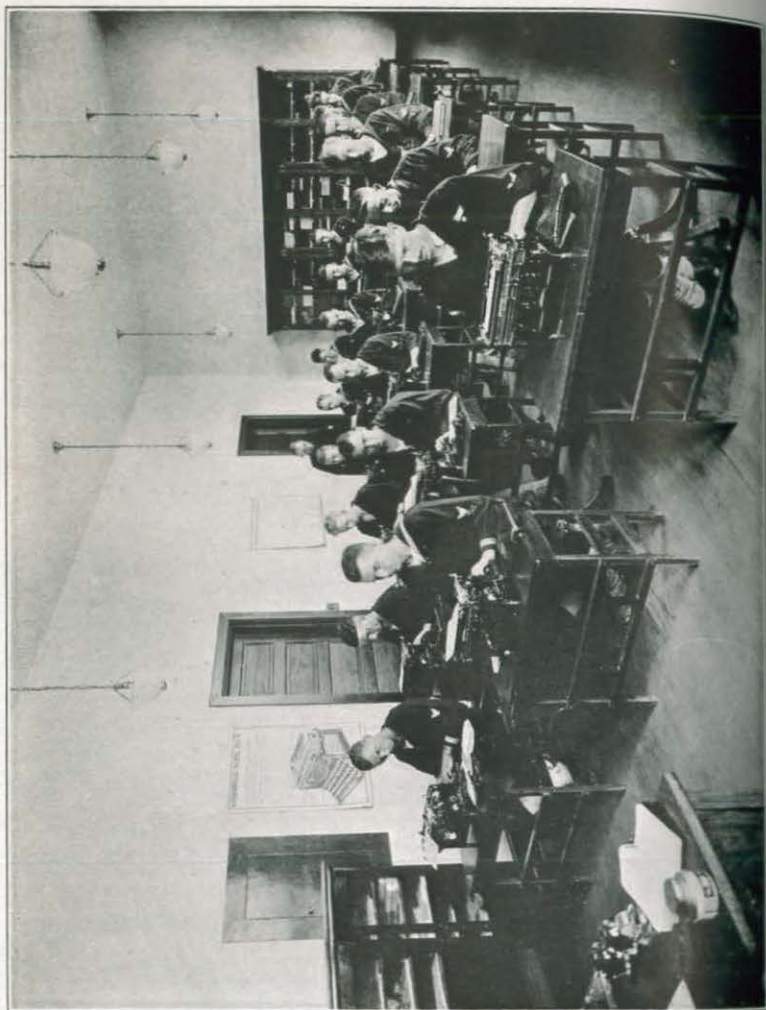


INSTRUCTION IN URINALYSIS, HOSPITAL CORPS SCHOOL, GREAT LAKES, ILL.



PHARMACEUTICAL LABORATORY.





INSTRUCTION IN TYPEWRITING, HOSPITAL CORPS SCHOOL

## HOSPITAL CORPS NEWS.

*The man-power bill of September, 1918.*—On August 6, 1918, when the war was going full tilt all recruiting was stopped by order of the Secretary of the Navy. The new selective service law (so-called man-power bill) was about to pass the legislative branch of the Government and the voluntary system of enlistment was to be temporarily put aside. In September the new law was passed. Between August 6 and early in October no men entered the Navy and none entered the Hospital Corps. Early in October the provisions of the man-power bill began to sweep men between the ages of 18-21 and 31-45 into the Army and Navy. A provision had been made, however, that allowed a few men to come into the Navy by induction and through this special avenue the medical department was permitted to get its Hospital Corps because it was believed that a man who sought the medical department or who had an interest in pharmaceutical, medical, or surgical work would make the best type of man for this branch of the service. By October the young men who sought this corps as a field of service began to pour in until the Hospital Corps schools once more became filled to overflowing.

*The armistice* was signed November 11, 1918, and the man-power bill became inoperative and men were again unable to enter the service. As soon as the first excitement and joy due to the termination of hostilities had subsided, the troops and the Navy began to come back from Europe. The sick and wounded were of course given first consideration. The great Navy transports which had carried practically one-half the American Army over became great hospital or ambulance ships. The number of hospital corpsmen on these vessels had to be increased. Ships came in to New York week after week with thousands of Army sick and wounded on each trip. The work of the medical department grew and grew. The work of the Hospital Corps became more and more strenuous. Just at this time when at sea the medical department of the Navy was most busily engaged with the returning Army on November 15, 1918, demobilization of the Navy began. Those who had dependents and those who desired to return to studies interrupted by the war, were so far as possible given consideration first, and many thousands of men and officers were released and allowed to leave active service in the Navy and return to a civilian status. Unfortunately, due to the increased burdens of the winter's work, the medical department



could not be quite as liberal in its policy of release from the service as was possible for men who held other than Hospital Corps ratings.

*For the Hospital Corps a policy of release at the rate of 5 per cent a month for January 1, February 1, March 1, and April 1 was adopted, and it is believed that this policy struck a fair average between the needs of the medical department of the Navy and the needs of the hospital corpsmen who urgently requested release.* At first it seemed that the hospital corpsman was discriminated against, but soon it became plain that if the Army was to be properly cared for in its passage home across the North Atlantic, the hospital corpsman must stay on the job at any rate until the sick and wounded returned. It was soon found that it would take months to get the Army home and that the Navy must man the ships of the transport force, and that the number of ships in that force must be greatly increased. Ship after ship was withdrawn from the Naval Overseas Transportation Service and added to the transport service. German ships were sought in Germany and men were needed to man them so that the Army's return could be expedited.

*Many hundred hospital corpsmen were gathered in the cities of the east coast—notably New York, Philadelphia, and Norfolk—and given special instructions to fit them for the hard duty on the Navy transport.* At first some of the hospital corpsmen grumbled—they wanted to go home, they wanted to return to business left behind, they wanted to visit their wives, sweethearts, parents, or friends, but soon they came to see that men on the other side in the Army were to be thought of, and so they pocketed their own wishes and set their minds upon their work and turned toward their task with the willingness to serve that has always characterized the corps. In spite of the let-down which came when hostilities ceased, the hospital corpsmen continued to study, to work, and work hard.

*On January 6, 1919, recruiting was again allowed after having been discontinued for months.* Men began to come in and new hospital corpsmen began to enter the service. Without any special propaganda, without any special efforts being made, the popularity of the Hospital Corps showed in the way men were enlisting and re-enlisting. After all the hardships and what is more the petty and great annoyances of war-time conditions, the hospital corpsmen's younger brothers at home began to apply for first enlistment.

*The work of the Navy during the coming months will be large. It must continue. It is vital to the country. It must carry food to Europe, bring the Army home, and help in the establishment of a mercantile marine, and the hospital corpsman must continue to do his share and continue to add to the reputation he has made for himself whether at sea, ashore, with the Marines, or in our island possessions.*



HOSPITAL CORPS DRILL.

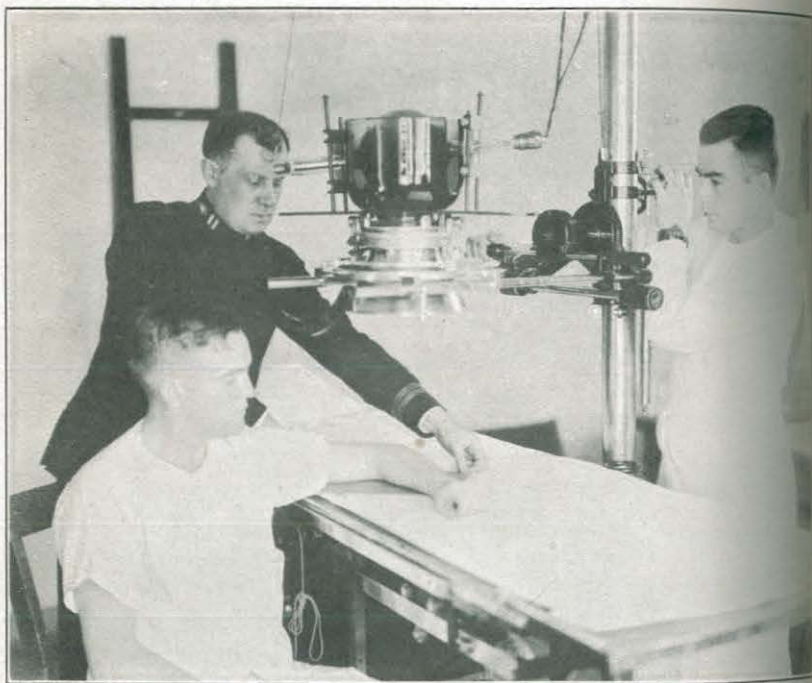


TEACHING PHARMACY IN A NAVAL DISPENSARY.





CLEANING TEST TUBES, NAVAL LABORATORY.



INSTRUCTION IN X-RAY PROCEDURE.

*A few chief pharmacist's mates* who have put in two years at sea are now coming ashore to naval hospitals and shore stations where their knowledge of the medical department may be broadened by coming again into the hospital and medical environment ashore.

*Reenlisting pharmacist's mates first class* are whenever possible given duty for a time at recruiting stations near their homes when they apply for such duty.

*Hospital Corps schools*, so over filled during the war are reorganizing on a much more healthy basis for future development of the corps. More individual instruction is now possible than when the numbers to be instructed were, in proportion to the limited number of teachers, so large.

*Men overseas who were kept overtime* have returned, been discharged, and many have reenlisted.

*The future of the corps is bright.* Never before have its fine traditions been better understood. Never before have its men been more appreciated. Never before has its training been better and its opportunities in the service so good or its opportunities in civil life upon expiration of enlistment brighter.

*The interest that the American Pharmaceutical Association* has taken in the Hospital Corps is shown by the fact that that association has sent the Bureau of Medicine and Surgery a notice to the effect that The American Pharmaceutical Association, through a special advisory committee, called the Advisory Committee of the American Pharmaceutical Association for Employment and Reestablishment of Soldier and Sailor Pharmacists, No. 1005, Mercantile Library Building, Cincinnati, Ohio, expects to help in the reestablishment and reemployment of pharmacists now in the service who return to civil life. This advisory committee has stated that an attempt to make arrangements for unrestricted reciprocal registration among the several State boards of pharmacy is being made for the benefit of soldier and sailor pharmacists and drug clerks. This committee states that "Pharmacists and drug clerks can be sure of assistance for their reestablishment and reemployment, if they immediately communicate with the committee, so that proper arrangements can be made by the time they are discharged from the service."

It is believed this interest of the civilian in the Navy man will outlive the war and that the young man who enters the hospital corps and serves a full enlistment in the Navy, leaving with an honorable discharge will find that the experience and knowledge gained by him during his period of association with the medical department of the Navy will prove of benefit to him either in or out of the service.







FOOTBALL TEAM AT A HOSPITAL CORPS SCHOOL.





NURSING AN INFECTIOUS CASE.



## Hospital Corpsmen Commended

The commander in chief, in the name of the President, has, among others, awarded the distinguished-service cross to the following-named hospital corpsmen for the acts of extraordinary heroism described after their names:

Pharmacist's Mate Third Class GEORGE DOUGLAS WITT, United States Navy, attached to Sixth Machine Gun Battalion, United States Marine Corps (No. 30379). For extraordinary heroism in action near St. Etienne-Arnes, France, October 6, 1918. Pharmacist's Mate Witt displayed remarkable bravery and coolness in giving medical aid to wounded marines while going forward with the assault waves during the attack north of Blanc Mont Ridge and near St. Etienne-Arnes, France, on October 6, 1918. Late in the afternoon on the same date while giving first aid to a wounded marine in an advance machine-gun post he was shot and seriously wounded by an enemy sniper. Home address, G. M. Witt, Harrington, Wash.

Chief Pharmacist's Mate ROBERT S. COCHRANE, United States Navy, attached to Sixth Machine Gun Battalion, United States Marine Corps. For extraordinary heroism in action near St. Etienne, France, October 3-4, 1918. Chief Pharmacist's Mate Cochrane continued to dress the wounded when the area in which he was working was swept by machine-gun fire. He was an example of coolness to all during 48 hours of continuous shell fire, never hesitating to expose himself to danger when assistance was needed. Home address, William J. Reid, uncle, Hichburg, S. C.

Pharmacist's Mate (third class) FRANK R. YATES, United States Navy, attached to Sixth Machine Gun Battalion, United States



Marine Corps (No. 303798). For extraordinary heroism in action near St. Etienne, France, October 4, 1918. Pharmacist's Mate Yates remained at his post even after his gas mask was torn from his face by a shell fragment. Late in the day in a violent barrage of machine-gun fire he showed entire disregard for his own safety in ministering to wounded soldiers and in organizing two crews of litter bearers to carry them from the road to the dressing station. Home address, James A. Yates, father, Alturas, Cal. (From The Official United States Bulletin, Thursday, Jan. 2, 1919.)

While the war was going on, every newspaper praised the gallantry and fighting qualities of our soldiers overseas. They deserved it but there is also another branch of the service which worked day and night in tending to the wounded, who deserve more than praise—the naval medical corps in the field. The soldier had the thrills of the raging battle to break the monotony. He had the opportunity and the satisfaction of giving blow for blow and returning shot for shot, but the doctor at the dressing station or the unarmed hospital corpsmen dressing the wounded in the very first waves of the attack, had no such chances. When the shells fell thick and fast around and in the first aid dressing stations, they worked silently on, not even stopping to think of their own dangers but thinking only of relieving the pain and suffering of those about them. I have seen them under fire and their splendid work deserves the admiration of us all. I remember the dressing station which had been established near Lucy last June. The Germans discovered it by their aviators who saw the stretcher bearers deposit load after load of their blood covered burdens at the door of an old building. It became a target for the Boche artillery, but even though the shells seemed to be bursting everywhere, the hospital corpsmen continued to walk fearlessly through that hell of iron and steel and to go for still another load; and the doctors—well they were too busy to allow shells to interfere with what they had to do, and they continued to do it. Some of the doctors have been decorated and in their citations you can read the story of their devotion to duty and their heroism, but not all men are decorated and yet these latter toiled as long and as ceaselessly as did the others. They all did their work well; all never can be cited and decorated too.

I shall never forget the dauntless spirit of the hospital corpsmen who were with us. A soldier can dig himself in, but a hospital corpsman is literally a man without shelter, even after the objective is reached. I used to see them in Belleau Woods, always on the move, answering the calls of wounded men, always exposing themselves to the Boche machine gun and continuous shell fire. Vincent Nolan, I

remember particularly well. He seemed to be everywhere and answering the cries of everybody. Many men may be thankful that such a man as Nolan joined the Hospital Corps.

Most of us think we have gone through hell—and maybe we have. We also made it a hell for the Boche. We gave it to them hot and heavy, but, as marines who have been in the thick of it, great credit goes to the naval medical men and the Hospital Corps who attended and aided in relieving the victims of German shells. (First Lieut. H. A. Zichke, U. S. M. C. Second Lieut. L. E. Battles, U. S. M. C.)

In the October number of the SUPPLEMENT there was reprinted from the Washington Star of June 15, 1918, an article describing the work of the hospital corpsmen with the Fifth Regiment of Marines at Chateau Thierry, from which is quoted the following:

The sublimest deed of heroism performed was that of another pharmacist's mate, a New York State boy, whose name the censorship does not permit me to give. He had made his way to the side of a wounded man and, though struck in his own heel by a bullet, continued to stanch his comrade's flow of blood. A second bullet pierced his skull.

The bureau has been informed that the name of the hospital corpsman referred to in this paragraph is FRANK G. WELTY, Pharmacist's Mate second class, whose next of kin live in Utica, N. Y.

NAVY DEPARTMENT,  
*Washington, D. C., October 18, 1918.*

From: The Secretary of the Navy.

To: John Humphry Marks, pharmacist's mate, second class, United States Navy (commanding officer Sixth Regiment Marine Corps, A. E. F.).

Subject: Commendation for distinguished conduct in action.

1. The department is in receipt of a communication from the Major General Commandant, Marine Corps, containing extracts from a communication from the regimental commander, Headquarters, Sixth Regiment Marine Corps, American Expeditionary Forces, July 26, 1918, to the division commander, from which the following is quoted for your information:

Hospital Apprentices John Marks and Leonard Barker, United States Navy, in the attack on Tigny on July 19, labored courageously and tirelessly throughout the day and well into the night in dressing the wounded on the field and superintending their evacuation. This work was carried on both in the open and under inadequate shelter.

The department takes pleasure in commending you for your gallant conduct in action.



## COMMENDATORY LETTERS.

From among the many letters and reports which reach the office of the Hospital Corps, it is easy to extract statements which indicate the excellent work performed by the hospital corpsmen during the last few months. The statements in these letters show that the spirit of self-sacrifice, faithfulness to duty, and untiring willingness to work in the presence of sickness and injury have become the inheritance of the new Hospital Corps and prove that the spirit and ideals of the smaller and less well-known prewar Hospital Corps have been taken up by the new men and carried into every part of the service, whether ashore or afloat, in this country, in Europe, or in our island possessions.

From among these a few, illustrative of the general picture, have been selected:

UNITED STATES ATLANTIC FLEET,  
U. S. S. "*Pennsylvania*," Flagship, November 4, 1918.

From: Commander in chief.

To: Ships present, Base 2.

Subject: Services of officers and men of Medical Corps during the recent epidemic of influenza.

1. The commander in chief desires to express his appreciation of the work performed by the officers and men of the Medical and Hospital Corps that came under his notice during the period of the recent epidemic of influenza. The skill displayed by these officers and men, and their untiring and self-sacrificing efforts in caring for the sick and in restricting the spread of the epidemic under the very trying conditions are worthy of the highest commendation.

2. Commanding officers will cause the contents of this letter to be made known to all concerned and will see that proper notation of these services is made on reports of fitness and service records of officers and men

A. W. GRANT,  
*Acting in Western Atlantic.*

(2) Extract from report of assistant force medical officer, cruiser and transport force to commander, Cruiser and Transport Force:

"It is with great pleasure that I here desire to call attention to the services performed by the hospital corps of the transport service. Their duties have been arduous and exacting, the hours long and hard, but with youth and the glamor of service to spur them on, they have responded faithfully to every call. When the history of the war is written they will surely come in for credit for services well and faithfully performed."

(3) Extract from medical officer's report to the commanding officer, U. S. S. — (a Navy transport):

"I can not speak in terms of sufficient commendation of the work of the hospital corps of this ship. Every man is called upon to exert himself to the limit of endurance during the entire round trip. No man complains, every man is on the job. During this last voyage many of them worked 24 hours at a stretch amid conditions that can never be understood by one ashore or on a man-of-war."

(4) Extract from medical officer's report to commanding officer, U. S. S. — (a Navy transport):

"The ability of the medical officers on this voyage to properly complete each day's work was due largely to the faithful and efficient work of the hospital corpsmen. They were expert in applying dressings and showed the commendable spirit that has always characterized the officers and crew of this ship in giving assistance to all. The independent qualifications of the corpsmen, only make it possible for a few medical officers to properly handle large numbers of patients in transit."

The commanding officer in his letter to the commander Cruiser and Transport Force in commenting on this report said, "The faithful work of the Hospital Corps merits high praise"

On board destroyers, cargo boats, and other small craft which carry ordinarily no medical officer the more experienced men of the Hospital Corps in the upper ratings represent the medical department of the Navy on the high seas, and they stood the severe test of caring for the sick during the influenza epidemic. Here they administered the first aid and nursing care needed and no indication has been received from vessels of this type to indicate that a single patient suffered from lack of proper attention or care. What little information in regard to the work of these men at sea has reached the Bureau has proven that they performed their duties not only with the spirit, willingness, and intelligence so well illustrated by the above-quoted commendations but that they did not fail when left to act alone without medical officers beside them. All these men on independent duty performed their duties for the medical department in the quiet, efficient, and intelligent manner expected. The following from commanding officer, U. S. S. — (a destroyer), to the Bureau of Medicine and Surgery is typical:

"I wish to call attention to ——— chief pharmacist's mate, U. S. Navy, who, while an attack of influenza was raging on this ship between July 12 and 27, 1918, did perform his duties in checking and treating the disease in a most worthy manner."

When the epidemic of influenza swept over the United States, naval stations were hit as a rule a little earlier than the nearby civil



population. In some places when the first shock of meeting the naval emergency was lessening it became possible for the Navy to help in the care of civilian sick. In the Hospital Corps Schools of the Navy there were many men undergoing the first period of their instruction. These men were temporarily taken from their schools and placed in naval hospitals and training stations to help during the influenza epidemic. In a few instances it was possible for their commanding officers to send them into the civil communities. From the civil hospitals where these men were for a few days permitted to work, from the mayors of some of the cities, and from many other sources, have come statements which show that the hospital corpsman is not only sufficiently trained to be of great value in the Navy, but he had been so trained as to be adaptable and capable of working with the same degree of success wherever he was sent. From these letters the following extracts are quoted:

"These men were extremely faithful in the discharge of all duties assigned to them; accept heartfelt thanks from citizens for tremendous and timely aid. \* \* \* assignment of experienced hospital corpsmen will save hundreds of lives. Had it not been for your men who were sent here to help us I certainly do not know how I could have handled the situation. \* \* \* the conduct and work of the men has been excellent. These men have earned the highest admiration by their close attention to their duties, by their zeal and fidelity, by their untiring efforts to procure comforts, by their obedience to orders. Now that the epidemic from which we have suffered so severely is practically over, I take the greatest pleasure in thanking you for the hospital corpsmen sent to help us. \* \* \* Your men have been uniformly courteous and have shown a most ready willingness to help. Their gentlemanly deportment and kindly ways will long be remembered by those with whom they labored. Without exception they have upheld the best traditions of our Navy and have been a credit to themselves and to the Navy. They worked faithfully and intelligently, giving long hours to the service without objection or complaint. They worked in excellent harmony with the regular nursing staff and relieved and strengthened it where the strain on the overworked nurses was greatest. I am not only expressing my personal appreciation and that of the County Board and Hospital administration, but of the many hundreds of patients who were benefited by the tireless, kindly, and efficient attention given them by these young men. They were always on the job, cheerful and willing. They worked with a will and power that astonished me."

The way a nurse feels about the work of the Hospital Corps is illustrated by the following letter:

"Though formal action was taken by the Red Cross chapter expressing appreciation of the spirit of helpfulness which prompted the loan of a staff of hospital corpsmen from the naval station to assist in caring for the patients in the emergency hospital, I feel that, as the nurse in charge of that hospital and other emergency nursing activities, I would be lacking in gratitude and appreciation if I did not add my personal thanks to the thanks of the whole nursing staff.

"I know better than anyone else how great was the need for help at the hospital; nurses could not be had, those on duty were working more hours daily than flesh and blood could stand very long, and the physicians were begging us to take in more patients. I was facing the problem of deciding between the needs of the patients and those of the small staff of nurses, when I was advised that a staff of hospital corpsmen was on the way to help us. Our men are growing accustomed to being warmly welcomed wherever they go nowadays, but I doubt if they have ever been more thankfully received than they were at that little emergency hospital. And how they did justify our faith in them! They did work that I'm sure they would never be called upon to do at the naval station, and did it well. They were always on the alert for chances to help, were most resourceful in meeting new situations; always cheerful and bright, and during the whole three weeks that they were with us, I never saw anything in their work or deportment that would reflect the least discredit on the uniform they wore.

"I thank you most sincerely for sending the hospital corpsmen to us, and if the time spent with us is considered in their rating, I hope the highest possible credit may be given them."

To all these commendations of the hospital corpsmen telling of their work while under instruction in Hospital Corps schools, of their work while on duty in hospitals and at shore stations, of their work in the fleet, in the Navy transport service, on board destroyers, at aviation stations, at home and abroad in tropical islands and in the freezing weather of the north Atlantic can be added the tributes paid to the work of these naval hospital corpsmen who found themselves in the Navy wearing khaki ashore in France as part of the American Expeditionary Forces.

Extract from report of regimental surgeon, dated December 22, 1918, Headquarters Eleventh Regiment, U. S. Marines, France:

"The junior medical officers of the regiment and the hospital corpsmen have done splendid work. To name those who have done work worthy of special mention would cause me to mention the name of everyone of the medical officers and all the hospital corpsmen. The Army medical officers who have come in contact with our corps-



men are very outspoken in their praise. Gorham, Butler, and Feldschmidt, of our Hospital Corps, received special commendation from Army medical officers for their work while they were doing temporary duty in an Army hospital."

Another letter reads as follows: "Probably it would be of interest to you to know some of the opinions regarding the Navy medical units serving with the marines in France. Only the highest praise can be given to all of the members of this unit, due to their splendid work and courage in advancing with the troops during an attack, establishing dressing stations, and the handling of wounded under shell fire. In the writer's opinion this was a great factor in upholding the high morale of our troops. The men went forward with the knowledge that if they were wounded or disabled they would be found and given medical treatment very soon after being injured. It is extremely difficult to properly estimate the value of this factor. The record of decorations conferred, and citations in orders, of both surgeons and hospital apprentices is indisputable evidence of their courage and self-sacrifice. Repeatedly I have seen hospital apprentices leave the safety of cover and cross through heavy barages of artillery and machine gun fire to minister to the wounded.

"(Signed)

SHALER LADD, *Captain U. S. M. C.*"

## PROMOTIONS.

Everybody in the Hospital Corps, from the new hospital apprentice to the chief pharmacist's mate, wants to be promoted. They all want the added money, and they all want the rating badge. When they get one stripe, they immediately want the second. No sooner are they made second class than they look forward to the next grade, and so on. This is as it should be, and is most praiseworthy.

*But* there is another side to the story. Like the youngster who wants a ball or a bat, a sled or a pair of skates, they want it *right away*, and some want it without doing their share to get it. The youngster has to carry in the coal and carry out the ashes, hustle the wood, clean the walks, and rake up the leaves *before* he is entitled to the fruits of his labors. Likewise the hospital corpsman should acquire the increase of knowledge and experience before he may justly expect the increase of pay and responsibility.

The training of a hospital corpsman has two things in view—one for the Government and one for himself. The first is usefulness to the sick, the second is proper recognition of his services through advancement in rating and promotion up to and including the warrant grade of pharmacist. Usefulness to the sick is the paramount duty; the rewards of personal ambition must be considered as secondary.

Promotion in the Hospital Corps has been rapid during the past year. This was due, in great measure, to the sudden war-time increase of the service. Unfortunately in some cases poorly qualified men have been promoted from rate to rate, finally reaching the chief's billet; and in some cases men with poor qualifications have even received a temporary appointment as pharmacist. I have reviewed many examination papers of men coming up for chief pharmacist's mate who have been rated, under existing orders, after an examination that, a few years ago, would have been considered easy for an old-style hospital apprentice, first class. This is not the fault of the hospital corpsman, but is due to the hurry of war and a willingness on the part of some medical officers to recommend men for promotion without demanding conclusive evidence of sufficient knowledge and worth.

Acting appointments as chief are now given by commanding officers without reference to the Bureau of Navigation, the only limitations being that a man shall have served the required period ashore in the rating of pharmacist's mate, first class, and shall pass



an examination. On one ship the examination is thorough and fair, a test of knowledge and ability; on the next ship the examination is more easy, giving those who take it an unfair advantage over other men. At present a chief pharmacist's mate may be made permanent by his commanding officer, provided he has served six months at sea under an acting appointment and passes an examination. In many cases the examination given for this appointment is not sufficiently comprehensive to fulfill its purpose; i. e., to bring increased reward to only the best and most efficient men. In either case commanding officers must depend upon the recommendations of examining boards as a basis for promotion. (Bureau of Navigation circular letter 139-18.)

All the above leads up to what follows. The Bureau of Medicine and Surgery is now holding medical officers to the prewar standard for Hospital Corps examinations so things will tighten up from now on for when a man reaches the chief's rate he is entitled to come up for the permanent grade of pharmacist, provided he has been three years in the service, two of which have been spent at sea.

The pharmacist's job is one which requires real ability and should be given to only the best men in the Hospital Corps. Appointments to the permanent warrant rank are made upon the recommendation of the Naval Examining Board in Washington, and all the members of that board are "from Missouri." When a man reaches the grade of pharmacist, he *must* know the clerical work of the medical department from the ground up. If he does not, he is not of much value as a pharmacist. While you are on ships or at shore stations, you must *make* opportunities for yourself to learn the clerical work of the higher rates, so that you may follow the changes in orders and procedure that occur from time to time, and thus be fitted to pass the examination in administration which is required of a pharmacist. It is useless to let the clerical work slide along for years just because you are not assigned to duty in the office; for you can not possibly learn it from a book at the last moment before coming up for chief.

Men have attained the temporary pharmacist grade none too well qualified, as the following quotation from the director of the Correspondence Course for Naval Pharmacists in his answer to question No. 10 of that course indicates:

"You, pharmacists that are and that are to be, are responsible for the proper construction of every requisition that emanates from the medical department of the hospital, dispensary, ship, or station to which you are assigned for duty. Commanding and executive officers depend upon you to put these papers in proper order before presenting them for signature. After going over the items and quantities, and the general form and wording of the requisition, they are

prone to accept the assurance of the pharmacist that everything is in proper form, all copies alike, headings and subheadings correct, etc.; and you doubtless believe your assurance to be reliable. But it is a fact that practically no day passes on which the Bureau of Medicine and Surgery does not receive for approval requisitions improperly composed in every conceivable way.

"There is no excuse for this state of affairs. Instructions regarding the proper making of requisitions are plentiful and explicit—in the Supply Table, in the Manual for the Medical Department, in the Hospital Corps Handy Book, in the Hospital Corps SUPPLEMENT to the Bulletin. It is your duty to study them to the point of perfect knowledge. If a hospital corpsman makes out the reports and returns under your orders, and says they are correct, do not accept his word for it until you have proved it by carefully going over the work yourself. Years of experience as a medical officer in the Navy have led me to feel that it is necessary to always check the correctness of every paper submitted for signature. The pharmacist who fails to insure the correctness of his paper work fails in one of his most important duties. Inaccuracy of paper work entails the expenditure, by medical officers, of hours of labor that might be spent on other matters, if confidence in the ability and carefulness of the pharmacist were not so often destroyed by the bureau's return, for correction, of requisitions and reports."

If you want to be rated up, you must do your share toward earning the rating. If you want to be a pharmacist, you must prepare yourself *now* for that grade. (H. A. M.)

Since the last issue of the SUPPLEMENT the Bureau of Medicine and Surgery has been informed that the following named men have been recommended for the rate:

#### CHIEF PHARMACIST'S MATES.

Andrews, H. W.  
Anglin, R. E.  
Barney, G. J.  
Barrington, W. M.  
Bartlett, H. M.  
Bolstad, L. H.  
Bond, G. E.  
Bromlow, R. M.  
Brown, R. D.  
Bruns, P. W.  
Cason, W. M.  
Castillon, L. A.  
Chevallier, J. L.  
Chiles, P. L.  
Clement, C.  
Cooney, E. J.

Corr, F. A.  
Cottrill, J. L.  
Coulter, J. R.  
Cowlin, D. G.  
Crowl, H. G.  
Cusick, W. F.  
Dacus, C. C.  
Dick, W. E.  
D'Mare, D.  
Downer, G. D.  
Durkin, W. J.  
Eads, J. T.  
Ebersbach, R. V.  
Elliott, V. B.  
Evans, H. R.  
Fagan, J. E.



## CHIEF PHARMACIST'S MATES—continued.

Farner, C. J.	Moore, J. E.
Felton, R. S.	Moore, L. P.
Ferguson, F. R.	Noonan, W. W.
Flodeen, C. E.	Olson, J. G.
Fowble, E.	Pease, C. W.
Froshaug, J. A.	Peluse, S.
Fry, A. R.	Perry, R. A.
Gardner, R. C.	Peterson, R. E.
Gault, P. S.	Pflastirer, R. M.
Goldberg, E.	Phillips, H. P.
Goldstucker, H. M.	Pope, W. B.
Grigsby, L. S.	Polk, L. L.
Hammond, Le R.	Prather, A. G.
Hancock, J. C. J.	Ralls, J. P.
Hathaway, J. A.	Rehback, E. A.
Havlicheck, J. T.	Reish, J. J.
Haynie, J. M.	Rice, B. G.
Haywood, M. E.	Robarge, A. A.
Hill, J. A.	Robichau, W. D. A.
Huntsinger, F. O.	Rogers, J. W.
Hutchins, C. L.	Scribner, W. A.
Jackson, P. L.	Scruggs, A. C.
Jacobs, D. A.	Slyter, R. I.
Jacobsen, I. C.	Steele, M. L.
Kemp, W. La R.	Stephenson, W. McK.
Kennedy, J. A.	Stover, J. R.
Kezer, C. H.	Strafford, P. C.
King, J. R.	Swang, L. N.
Kirkpatrick, O. Y.	Taft, S. C.
Kitchen, H. L.	Thomas, J.
Knisely, B. A.	Tracy, L. B.
Lawrence, J. A.	Utterbach, C. W.
Leforgeais, F. J.	Upton, R.
Logan, J. E.	Vance, J. L. R.
McCoy, C. L.	Walker, C. E.
McDonald, J. R.	Washburn, W. A.
McEachern, J. D.	Wenkheimer, K. L.
McLean, W. G.	Whaley, W.
McRae, M. C.	Whayne, W. A.
Martin, R. E.	Whitehead, M. J.
Miller, C. A.	Williams, E. B.
Miller, G. A.	Williams, O. R.
Miller, H.	Wiseman, K. D.
Miller, S. P.	Woods, A. E.
Minear, E. W.	Wynne, J. H.

## PHARMACIST'S MATES, FIRST CLASS.

Adrian, G.	Arnett, H. A.
Anderson, C. A.	Augustine, G. V.
Anderson, D. C.	Avery, K. E.
Apollon, J. J.	Azlin, A. P.

Baird, E. J.  
 Balkansky, S. L.  
 Ball, A. F.  
 Ball, W. W.  
 Barrett, W. J.  
 Bartlett, H. M.  
 Battershill, R. R.  
 Beard, H. J.  
 Beaudreau, L. J.  
 Benham, N. B.  
 Benson, C. F.  
 Benline, C. J.  
 Berger, D. C.  
 Betts, M.  
 Ricknell, M. F.  
 Bills, E. C.  
 Birchard, B. D.  
 Blair, D. J.  
 Blanck, W. H.  
 Bloom, F. E.  
 Bockemuehl, A. M.  
 Boerner, E. G.  
 Bonhm, J. C.  
 Boswell, W. I.  
 Bracken, W. J.  
 Braconier, F. G.  
 Broadbent, O. P.  
 Brooks, S. C.  
 Brown, C. I.  
 Brown, F. I.  
 Buechele, K. L.  
 Burres, C. S.  
 Burrus, S. B.  
 Burt, R. H.  
 Buterley, W. S.  
 Campbell, D. S.  
 Carney, P. T.  
 Chariton, A. R.  
 Clark, R. J.  
 Clements, E. S.  
 Clift, C. E.  
 Clumpner, J. A.  
 Cobb, A. C., Jr.  
 Coburn, W. S.  
 Collins, W. J.  
 Colvin, G. J.  
 Compton, W. G.  
 Cook, L. A.  
 Coon, H. N.  
 Coray, Q. B.  
 Cordiner, P. C.

Core, D. E.  
 Corley, L. H.  
 Cosnahan, F. S.  
 Cottrill, J. L.  
 Craig, H. B.  
 Crawford, C. C.  
 Crawford, J. R.  
 Crow, W. G.  
 Cummins, L. S.  
 Curd, W. S.  
 Currey, C. H.  
 Curtis, G. C.  
 Curtis, V. R.  
 Cutting, C. P.  
 Davenport, R. B.  
 Davis, C. E.  
 Davis, J. O.  
 Davis, J. P.  
 Davis, J. S.  
 Davis, L. G.  
 Davis, W. V.  
 Davidson, R. G.  
 Dempsey, J. A.  
 De Puy, R.  
 Dibling, F. A.  
 Djieckmann, L.  
 Diver, J. A.  
 Dodson, W. D.  
 Dudley, H. Z.  
 Duncan, E. L.  
 Duncan, W. P.  
 Eckman, F. D.  
 Falk, G. R.  
 Field, J. H.  
 Fitzgerald, W. T.  
 Fogarty, E. C.  
 Foldberg, H. C.  
 Foley, C. F.  
 Forbes, V. L. R.  
 Ford, E. F.  
 Foremen, W. S.  
 Freitag, B. S. L.  
 French, E. C.  
 Fulton, D. N.  
 Fuson, C. Z.  
 Gage, R. E.  
 Gagnon, J. N.  
 Garrigan, T. L.  
 Gassler, J. F., jr.  
 Gault, P. S.  
 Gerald, L. E.



- Gerling, C. W.  
 Gibson, E.  
 Gilman, A.  
 Ginsburg, L.  
 Goldsborough, R. R.  
 Gothard, O. L.  
 Greene, C. E.  
 Gould, L. P.  
 Graham, C. H.  
 Grownney, L. E.  
 Hackman, W. J. L.  
 Hagedorn, O. O.  
 Hall, M. W.  
 Hanly, W. R.  
 Hardenbrook, C. V.  
 Harkins, E. W.  
 Harmon, E. J.  
 Harper, I. J.  
 Hastings, L. W.  
 Hayes, A. G.  
 Healy, F. W.  
 Healey, J. E.  
 Hendricks, F. R.  
 Hennenway, E. J.  
 Henriques, L.  
 Henshaw, W. C.  
 Higgins, H. L.  
 Hinze, A. Z.  
 Hodgkinson, L. J.  
 Hollen, A. F.  
 Hopewell, R.  
 Horton, G. G.  
 Hoskins, R. H.  
 Howes, R. R.  
 Hoxie, W. H.  
 Huffman, T. G.  
 Hull, H. C.  
 Hunt, J. H.  
 Hunter, E. H.  
 Ingham, J. R.  
 Jackson, A.  
 Johnson, H. R.  
 Johnson, Le. R.  
 Johnson, W. W.  
 Joerger, J. W.  
 Jones, G. E.  
 Keefe, J. R.  
 Kelly, J. W.  
 Keye, J. D.  
 Kilgore, J. C.  
 King, W. R.  
 Kirkpatrick, O. Y.  
 Kistler, W. D.  
 Konreich, H.  
 Lacey, C.  
 Lambert, L. R.  
 Lambert, R. O.  
 Lang, R. A.  
 Lancaster, J. P.  
 Lanone, O. J.  
 Larsen, H. B.  
 Larwood, C. H.  
 La Valley, L. E.  
 Leak, L. N.  
 Lentz, J. R.  
 Lewis, C. C.  
 Lewis, S. J.  
 Lewis, T. J.  
 Lill, H. S.  
 Little, A. A.  
 Long, J. C.  
 Long, J. K.  
 Long, L. C.  
 Long, S. C.  
 Loomis, R. H.  
 Lopin, N. A.  
 Low, C. L.  
 Lucas, I. R.  
 Lyons, E. G.  
 McCallum, M. C.  
 McDowell, T. F.  
 McGinley, T. J.  
 McGinnis, R. D.  
 McGovern, T. J.  
 McHenry, R.  
 McLain, M. C.  
 McRae, M. C.  
 MacKeigan, A. S.  
 Macomber, I. J.  
 Madigan, J. W.  
 Mangold, M. H.  
 Martin, W. T.  
 Mason, P. T.  
 Mayer, A. E.  
 McGahee, W. D.  
 Millar, R. A.  
 Miller, J. D.  
 Miller Le R. R.  
 Mobley, G. O.  
 Moore, H. H.  
 Moore, J. M.  
 Moore, S. C.

## PHARMACIST'S MATES, FIRST CLASS—continued.

Moore, S. L.	Rosenbloom, H.
Moore, W. F.	Ross, C. E.
Mundorf, L. P. H.	Ross, J. B.
Murphy, O. F.	Ross, V. W.
Murray, J. H.	Roussell, S. D.
Myers, D. M.	Roy, L. H.
Newman, W. M.	Royal, J. R.
Nichols, S. H.	Scott, H. D. L.
Noyce, A. De W.	Scott, J. R.
Oatway, C. E.	Scribner, W. A.
O'Brien, P. J.	Sells, J. W.
O'Conner, C. H.	Sevison, F. McK.
O'Donnell, P. J.	Shaw, C. A.
O'Donnolly, V.	Sheehan, J. Q.
O'Leary, C. J.	Sheets, A. E.
Olson, E. E.	Sherman, L. H.
Omer, L. M.	Skinner, J. E.
Osborne, D. B.	Slade, L. C.
Osmun, G. K.	Smith, J. C.
Owen, L. E.	Smith, L. K.
Owens, A. W.	Smith, P. B.
Oxford, J. M.	Sowers, T. L.
Park, M. C.	Spence, W. M.
Paulson, P. E.	Spicer, V. D. P.
Paynter, R. H.	Staub, R. G.
Pearson, J. B.	Stafford, M. W.
Pearson, W. N.	Steele, M. L.
Pelletier, N. H.	Stone, J. H.
Pence, L. S.	Stowers, C. S.
Pence, R. D.	Surface, A. L.
Pendergast, J. J.	Sutton, A. E.
Perry, H. L.	Sutton, F.
Peterson, I. A.	Swanson, W. B.
Peterson, L. R.	Swope, J. E. W.
Phelps, J. B.	Taff, C. L.
Phillips, C. F.	Temm, F. V. L.
Phillips, H. P.	Temple, W. N.
Phlegar, R. A.	Thomson, W. A.
Pool, R. E.	Tillotson, W. C.
Prows, J. H.	Timmons, E. D.
Powell, H. R.	Tonnies, R. H.
Pyle, H. F.	Troop, G. S.
Reed, E. T.	Tyner, G. S.
Reese, R. L.	Vaudrenull, A. J.
Richardson, J. R.	Vogelsang, C. W.
Ries, J. D.	Wackerlin, G. W.
Roat, R. N.	Wall, F. J.
Robbins, H. H.	Walker, B. L.
Robertson, C. C.	Warren, C. C.
Robertson, E.	Watkins, E. H.
Robinson, R.	Watkins, W. J.
Ropes, W. M.	Whayne, W. A.



Welling, I. T.

West, A.

Whiting, A. W.

Wickson, R. M.

Wiggins, P. R.

Wilcox, L. E.

Wiley, H. G.

Williams, B. N.

Williams, E.

Williamson, C. E.

Wilton, W. G.

Winn, W. W.

Wood, C. L. R.

Wood, R. G.

Woodburn, J. H.

Woodley, K. C.

Woodsey, G. L.

Woodson, R. B.

Wright, I. A.

Wright, P. L.

Wroblewski, C. M.

Yewell, J. V.

Young, Roy.

## CORRESPONDENCE COURSE FOR NAVAL PHARMACISTS.

## PAPER NO. 9.

## PROBLEM.

A new permanent naval hospital with a capacity for 500 patients is to be commissioned and it is desired to fully equip two adjoining rooms as a dispensary proper and a stock and manufacturing room. Discuss in detail the equipment necessary for such a modern and efficient dispensary, emphasizing the following important facts:

(a) Construction and arrangement of fixtures, prescription counter, and manufacturing table. Draw up specifications for same.

(b) Make specifications for ointment pots, giving size, name, and number required.

(c) Specifications for tincture and salt mouth bottles, including name, sizes, and number required.

(d) Counter scales and prescription balances are essential. Draw up specifications for same.

(e) What precautionary measures would you take for the safe handling of narcotics and inflammables? Give specifications for the construction of an inflammable cellar and narcotic locker.

NOTE.—In the above problem, manufacturers' names and estimated cost of each item and the total cost of construction should be given.

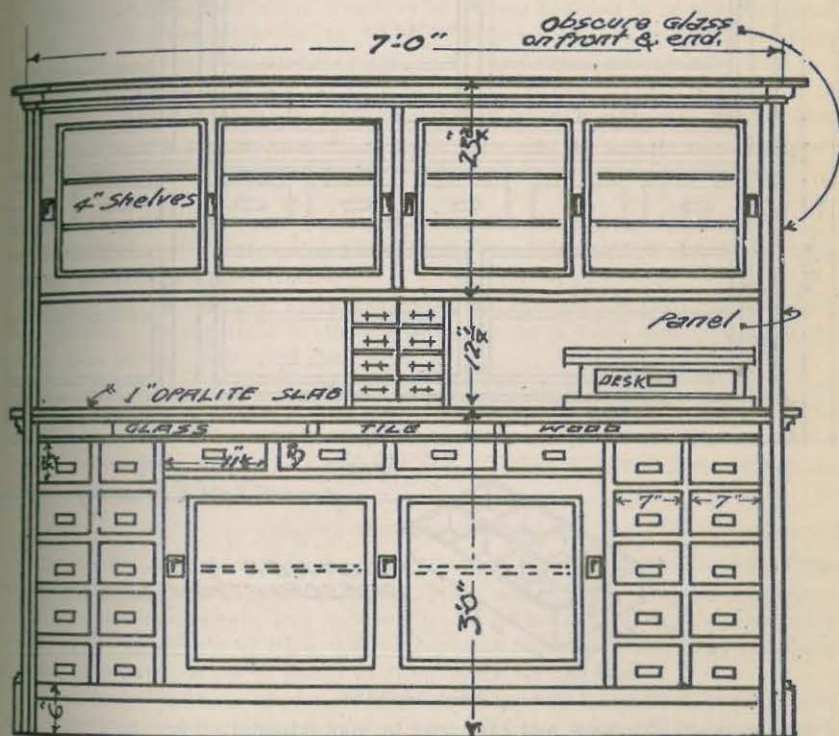
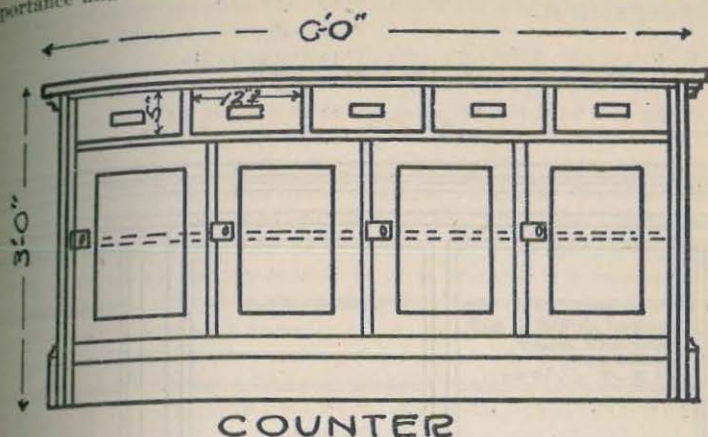
This problem includes equipment only, and not supplies.

## ANSWER TO No. 9.

## DISPENSARY EQUIPMENT.

The ideal naval dispensary should consist of a large room with the stock in it so arranged that everything would be easily accessible. It should be about 20 by 30 feet and have sufficient number of windows to enable the pharmacist

to do most of his work by daylight. The question of water supply is of vital importance and it should be centrally located, preferably near the prescription



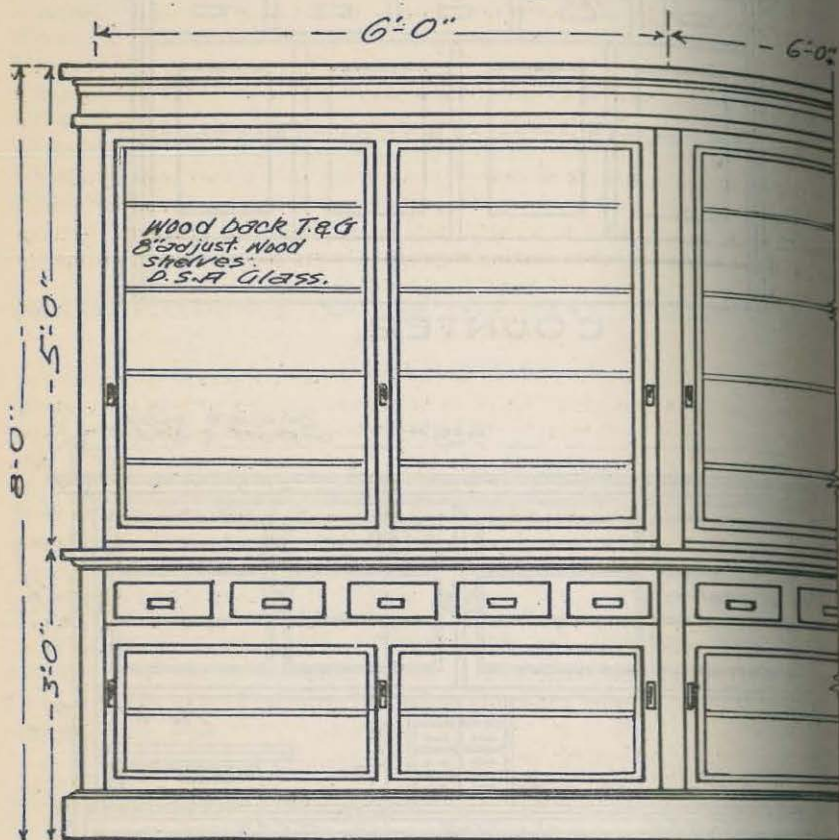
## PRESCRIPTION SECTION.

case, where most of the work is done. The fixtures in the dispensary will consist of wall casings, which come in 6-foot sections, the prescription case, and the manufacturing counter.

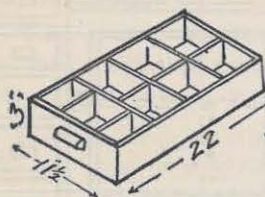


Dispensary equipment not enumerated on the following pages will be found on the supply table, and it is assumed that those articles will be requested when submitting Form B.

SCALE 1 IN = 1 ft.



WALL CASES  
(6'-0" section)



DRAWER TO  
PRESCRIPTION SECTION.

WALL CASINGS.

*Specification.*—To be 8 feet high and in approximately 6-foot sections. The lower part of the wall casing to have an 18-inch ledge and to be 36 inches high, to have one row of drawers under ledge and all drawers to be dovetailed. Below the drawers are to be cupboards with one shelf and to be inclosed with either panel or glass side sliding doors and the doors to slide on patent ball-bearing sheaves and steel tracks.

The upper section to be 5 feet high and to have 8-inch shelves in the clear, the case to have panel backs with four adjustable shelves inclosed with sliding doors, each door to have one light of glass and the doors to slide on patent ball-bearing sheaves and steel tracks.

All woodwork to view to be of first quality kiln-dried ash or oak, the balance of wood to be of good quality poplar or chestnut, as best suited for their respective purposes, and all shelves to be lipped with hardwood to match exterior fixtures.

The object of drawing up specifications for wall casings as above mentioned is to enable the pharmacist to install dispensary fixtures with the least possible loss of time, as these fixtures are manufactured in 6-foot sections, and if the dimensions of the dispensary be furnished the manufacturer he will be in position to furnish a definite number of these sections in a very short while.

The estimated cost will be about \$90 per section, but owing to market conditions it would be advisable to write to any manufacturer of druggists' fixtures for the latest quotation when making requisition. Six sections would ordinarily be required to fully equip a 20 by 30 foot dispensary.

#### PREScription CASE.

*Specification.*—To be 7 feet long and ends of prescription case to be paneled to a height of 36 inches, above which to be sashes inclosed with obscure glass.

The rear of lower work counter to be 36 inches high and under top to have row of slides, containing porcelain pill, paste, and other slides, and below this to be a row of drawers, several of which to be divided as per illustration in blue print. To have also two rows of drawers at each end, each row to contain five drawers and the center space to have one adjustable shelf inclosed with paneled or glass doors.

The upper part of prescription case as shown in the accompanying blue print to be a series of adjustable shelves inclosed with side sliding doors; all doors to have either clear or obscured glass as preferred and to slide on patent ball-bearing sheaves and steel tracks.

Between the work counter and upper case to be two rows of four drawers each for capsules. To the right of these drawers to be a small desk with drawer as per blue print. Estimated cost, \$170.

The top of the prescription counter to have one piece of white glass, ground, with polished edges. To be 7 feet long, 25 inches wide, and 1 inch thick. The above glass to be of the very best grade, perfectly white and free from all sand and carbon marks and to be furnished and installed in place and manner desired. Estimated cost, \$27.

#### MANUFACTURING COUNTER.

*Specification.*—To be 6 feet long, 36 inches high, and 26 inches wide. The front and ends to be paneled in a neat, plain design. The rear of counter to have one row of drawers and cupboards, the cupboards to have one movable shelf. The dimensions of these will be found in the blue print. The basement in rear of counter to set in recess to allow space for the feet.

All hardware used on the manufacturing counter to be of good quality solid bronze, and woodwork exposed to view to receive one coat of filler, after which it is to receive two coats of good flowing varnish and rubbed down to an egg gloss with oil and pumice stone. Estimated cost, \$60.

The top of the manufacturing counter to have a piece of white glass, ground and polished edges. To be 6 feet long, 26 inches wide, and 1 inch thick. To be of the very best grade, perfectly white, free from all sand and carbon marks. Estimated cost, \$30.



The wall casings and prescription case to have the same quality hardware finish, and wood as called for in the specifications for the manufacturing counter.

#### DRUG CANS.

*Specification.*—To be made of heavy tin japanned of a rich olive-green color, with gold lines at top and bottom. The lids to be hinged and cover the entire top of cans and providing free access to the contents.

Metal labels, lettered in black on yellow background and to be held in place by neat frames, which are detachable. Dimensions, 6 by 6 by  $8\frac{1}{4}$  inches. Estimated cost, \$0.90 each. Label, \$0.10 each.

The following is a list of drugs, which on account of their bulk require to be stored in such containers as above specified:

- |                    |                        |
|--------------------|------------------------|
| 1. Cera alba.      | 9. Linum.              |
| 2. Cera flava.     | 10. Prunus virginiana. |
| 3. Spermaceti.     | 11. Chondrus.          |
| 4. Sapo granulata. | 12. Paraffinum.        |
| 5. Magnesia.       | 13. Gelatinum.         |
| 6. Kaolinum.       | 14. Fol. digitalis.    |
| 7. Pumex.          | 15. Resinae.           |
| 8. Quillaja.       | 16. Sinapis.           |

#### OINTMENT JARS.

*Specification.*—To be of white opaque glass, 1-pound capacity, steeple top. Height  $6\frac{1}{4}$  inches. Labels to be oblong and have square corners, white ground with black letters and heavy gold borders. To be lettered in one line and where abbreviations are necessary the names of those which are official to conform strictly to the present United States Pharmacopoeia. Estimated cost, \$25.

The following is a list of ointment jars that are necessary for the required dispensary and with the above specifications may be had from any dealer:

- |                       |                                |
|-----------------------|--------------------------------|
| 1. Adeps Benzoin.     | 12. Ung. Belladon.             |
| 2. Adeps Lanae.       | 13. Ung. Gallae.               |
| 3. Adeps Lanae Hydr.  | 14. Ung. Hydrarg.              |
| 4. Ceratum.           | 15. Ung. Hydrarg. Ammon.       |
| 5. Cer. Resinae.      | 16. Ung. Hydrarg. Dil.         |
| 6. Petrolatum.        | 17. Ung. Hydrarg. Nitr.        |
| 7. Petrolatum alb.    | 18. Ung. Hydrarg. Oxid. Flav.  |
| 8. Unguentum.         | 19. Ung. Ichthyol 20 per cent. |
| 9. Ung. Ac. Borici.   | 20. Ung. Phenolis.             |
| 10. Ung. Ac. Tannici. | 21. Ung. Sulphur.              |
| 11. Ung. Aq. Rosae.   | 22. Ung. Zinci Oxid.           |

#### SHELF BOTTLES.

*Specifications.*—The shelf bottles to be square shape, recessed and with rounded corners. Blown in iron molds and special care taken to make the bottles smooth and well finished. The recess to be oblong and carried around to the sides of the bottle and the label to be specially made to conform, so that the edges be protected from injury. The syrup bottles to be with loose stopper; the 500-mill oil bottles to be furnished with loose glass cap.

The following is a list of the number and sizes of shelf bottles required; following this will be a list of the named drugs, chemicals and preparations for these bottles:

12 20,000-mil bottles, round and ground at the neck to receive glass stoppers. Bottom to be smooth. Estimated cost.....	\$24.00
20 4,000-mil tincture bottles, height 15 inches, cost.....	18.00
20 2,000-mil tincture bottles, height 12½ inches, cost.....	14.00
20 500-mil tincture bottles, height 8½ inches, cost.....	21.00
52 250-mil tincture bottles, height 6½ inches, cost.....	7.00
17 120-mil tincture bottles, height 5½ inches, cost.....	3.00
68 500-gm. salt mouth bottles, height 7½ inches, cost.....	18.00
36 250-gm. salt mouth bottles, height 6½ inches, cost.....	6.00
68 120-gm. salt mouth bottles, height 5½ inches, cost.....	7.00
22 60-gm. salt mouth bottles, height 4½ inches, cost.....	2.00
Total.....	120.00

## GLASS LABELS.

*Specifications.*—To be oblong with square corners, white ground, gold borders. Black line inside of border and black letters. The letters to be in two lines when necessary. The lettering to be in accordance with the present United States Pharmacopœia, with the necessary abbreviations. Estimated cost to label the above enumerated bottles, \$100.

## LIST OF SHELF BOTTLES.

## 20,000 mils (5 gallons):

1. Alcohol 70 per cent.
2. Alcohol 95 per cent.
3. Aqua Destillata.
4. Elixir Aromaticum.
5. Linimentum Saponis.
6. Linimentum Saponis Mollis.
7. Liquor Acidi Borici Saturatus.
8. Liquor Antisepticus.
9. Liquor Antisepticus Alkalinus.
10. Liquor Magnesii Sulphas 50 per cent.
11. Liquor Sodii Boratis Compositus.
12. Syrupus.

## 4,000 mils (1 gallon):

1. Elixir Aromaticum.
2. Elixir Digestivum Compositum.
3. Elixir Ferri Quininae et Strychninae.
4. Elixir Ferri Quininae et Strychninae Phosphatum.
5. Essentia Pepsini.
6. Fluidextractum Cascarae Sagradae Aromaticum.
7. Linimentum Camphorae.
8. Linimentum Chloroformi.
9. Linimentum Saponis.
10. Linimentum Saponis Mollis.
11. Liquor Antisepticus.

## 4,000 mils (1 gallon)—Continued.

12. Liquor Antisepticus Alkalinus.
13. Liquor Calcis.
14. Liquor Magnesii Sulphas 50 per cent.
15. Liquor Sodii Boratis Compositus.
16. Magma Magnesiae.
17. Mistura Glycyrrhizae Composita.
18. Phenol Liquefactum.
19. Tinctura Iodii.
20. Vinum Carni et Ferri.

## 2,000 mils (½ gallon):

1. Elixir Amygdalae Compositum.
2. Elixir Buchu.
3. Elixir Glycyrrhizae Aromaticum.
4. Elixir Paraldehydi.
5. Elixir Pepsini.
6. Elixir Sodii Bromidi.
7. Elixir Sodii Salicylatis.
8. Elixir Terpini Hydratis.
9. Elixir Terpini Hydratis cum Heroina.
10. Elixir Terpini Hydratis cum Codeina.
11. Elixir Trium Bromidorum.
12. Liquor Ferri et Ammonii Acetatis.



## LIST OF SHELF BOTTLES—continued.

2,000 mls ( $\frac{1}{2}$  gallon)—Continued.

13. Lotio Alba.
14. Lotio Plumbi et Opii.
15. Mistura Glycyrrhizae Composita cum Ammonii Chloridi.
16. Mistura Rhei et Sodae.
17. Mistura Sodae et Menthae.
18. Syrupus Pruni Virginianae.
19. Syrupus Tolutanus.
20. Tinctura Ferri Citro-Chloridi.

500 mls (1 pint):

1. Acetum Scillae.
2. Acidum Aceticum.
3. Acidum Aceticum Dilutum.
4. Acidum Aceticum Glaciale.
5. Acidum Formicum.
6. Acidum Hydriodicum Dilutum.
7. Acidum Hydrochloricum.
8. Acidum Hypophosphorosum.
9. Acidum Hypophosphorosum Dilutum.
10. Acidum Lacticum.
11. Acidum Nitricum.
12. Acidum Nitrohydrochloricum.
13. Acidum Oleicum.
14. Acidum Phosphoricum.
15. Aqua Ammoniae.
16. Aqua Ammoniae Fortior.
17. Aqua Amygdalae Amarae.
18. Aqua Anisi.
19. Aqua Aurantii Florum.
20. Aqua Aurantii Florum Fortior.
21. Aqua Camphorae.
22. Aqua Chloroformi.
23. Aqua Cinnamomi.
24. Aqua Destillata.
25. Aqua Foeniculi.
26. Aqua Gaultheriae.
27. Aqua Menthae Piperitae.
28. Aqua Menthae Viridis.
29. Aqua Rosae.
30. Aqua Rosae Fortior.
31. Fluidextractum Belladonnae Radicis.
32. Fluidextractum Cascarae Sagradae.
33. Fluidextractum Cimicifugae.
34. Fluidextractum Colchici Seminis.
35. Fluidextractum Condurango.
36. Fluidextractum Digitalis.
37. Fluidextractum Glycyrrhizae.

500 mls (1 pint)—Continued.

38. Fluidextractum Grindellae.
39. Fluidextractum Hydrastis (Aq.).
40. Fluidextractum Hyoscyami.
41. Fluidextractum Pini Strobb.
42. Fluidextractum Rhei.
43. Fluidextractum Sarsaparillae.
44. Fluidextractum Sarsaparillae Compositum.
45. Fluidextractum Scillae.
46. Fluidextractum Senegae.
47. Fluidextractum Sennae.
48. Fluidextractum Stillingiae.
49. Fluidextractum Tritici.
50. Fluidextractum Uvae Ursi.
51. Fluidextractum Zeae.
52. Glycerinum.
53. Linimentum Belladonnae.
54. Linimentum Camphorae.
55. Liquor Ferri Chloridi.
56. Liquor Ferri Subsulphatis.
57. Liquor Plumbi Subacetatis.
58. Mistura Glycyrrhizae Composita.
59. Mistura Pectoralis, Stokes.
60. Oleum Amygdalae Expressum.
61. Oleum Gossypii Seminis.
62. Oleum Lini.
63. Oleum Morrhuae.
64. Oleum Olivae.
65. Oleum Ricini.
66. Oleum Terebinthinae.
67. Pix Liquida.
68. Spiritus Amygdalae Amarae.
69. Spiritus Aurantii Compositus.
70. Spiritus Camphorae.
71. Spiritus Formicarum.
72. Spiritus Menthae Piperitae.
73. Spiritus Menthae Viridis.
74. Spiritus Vini Rectificatus.
75. Syrupus.
76. Syrupus Acidi Hydriodici.
77. Syrupus Aurantii.
78. Syrupus Picis Liquidae.
79. Syrupus Rhei.
80. Syrupus Rhei Aromaticus.
81. Syrupus Sarsaparillae Compositus.
82. Syrupus Scillae.
83. Syrupus Scillae Compositus.
84. Syrupus Senegae.

## LIST OF SHELF BOTTLES—continued.

250 mls (1 pint)—Continued.

85. Syrupus Senna.
86. Tinctura Aurantii Dulcis.
87. Tinctura Benzoini.
88. Tinctura Benzoini Composita.
89. Tinctura Cinchonae Composita.
90. Tinctura Gentianae Composita.
91. Tinctura Iodi.
92. Tinctura Opii Camphorata.
93. Tinctura Persionis.
94. Tinctura Persionis Composita.
95. Tinctura Quillaiæ.
96. Tinctura Rhei.
97. Tinctura Rhei Aromatica.
98. Tinctura Tolutana.
99. Tinctura Zingiberis.

250 mls ( $\frac{1}{2}$  pint):

1. Acidum Sulphuricum.
2. Acidum Sulphuricum Aromaticum.
3. Balsamum Peruvianum.
4. Chloroformum.
5. Fluidextractum Buchu.
6. Glyceritum Acidi Tannici.
7. Glyceritum Boroglycerini.
8. Mistura Opii et Chloroformi Composita.
9. Oleum Amygdalæ Amaræ.
10. Oleum Anisi.
11. Oleum Andropogon Nardi.
12. Oleum Aurantii.
13. Oleum Cadinum.
14. Oleum Carli.
15. Oleum Caryophylli.
16. Oleum Cassiæ.
17. Oleum Coriandri.
18. Oleum Cubebæ.
19. Oleum Lavandulæ.
20. Oleum Limonis.
21. Oleum Menthæ Piperitæ.
22. Oleum Menthæ Viridis.
23. Oleum Myristicæ.
24. Oleum Myrciæ.
25. Oleum Origan.
26. Oleum Pini Pumilionis.
27. Oleum Rosæ.
28. Oleum Rosmarini.
29. Oleum Sassafra.
30. Oleum Sinapis Volatile.
31. Oleum Thymi.
32. Paraldehyde.
33. Phenol.

250 mls ( $\frac{1}{2}$  pint)—Continued.

34. Spiritus Aetheris.
35. Spiritus Aetheris Nitrosi.
36. Spiritus Ammoniae Aromaticus.
37. Spiritus Chloroformi.
38. Syrupus Ipecacuanhæ.
39. Tinctura Asafoetidæ.
40. Tinctura Cannabis.
41. Tinctura Cantharidis.
42. Tinctura Cinnamomi.
43. Tinctura Cocci.
44. Tinctura Colchici Seminis.
45. Tinctura Ferri Chloridi.
46. Tinctura Gambir Composita.
47. Tinctura Hyoscyami.
48. Tinctura Lavendulæ Composita.
49. Tinctura Lobeliæ.
50. Tinctura Myrrhæ.
51. Tinctura Valerianæ.
52. Tinctura Valerianæ Ammoniatæ.

125 mls (4-ounce):

1. Acidum Hydrochloricum Dilutum.
2. Acidum Nitrohydrochloricum Dilutum.
3. Acidum Sulphuricum Dilutum.
4. Creosotum.
5. Eucalyptol.
6. Fluidextractum Ipecacuanhæ.
7. Fluidextractum Ergotæ.
8. Gualacol.
9. Liquor Potassi Arsenitis.
10. Terebenum.
11. Tinctura Aconiti.
12. Tinctura Belladonnæ Foliorum.
13. Tinctura Capsici.
14. Tinctura Digitalis.
15. Tinctura Gelsemii.
16. Tinctura Nucis Vomicae.
17. Tinctura Strophanthi.

500 gram (1 pound):

1. Acidum Benzoicum.
2. Acidum Boricum.
3. Acidum Camphoricum.
4. Acidum Gallicum.
5. Acidum Oxalicum.
6. Acidum Stearicum.
7. Althæa.



## LIST OF SHELF BOTTLES—continued.

## 500 gram (1 pound)—Continued.

8. Alumen.
9. Ammonii Benzoas.
10. Ammonii Bromidum.
11. Ammonii Iodidum.
12. Ammonii Sulphas.
13. Asafoetida.
14. Barii Carbonas.
15. Betanaphthol.
16. Calamina.
17. Calcii Carbonas Precipitatus.
18. Calcii Chloridum.
19. Carbo Animalis Purificatus.
20. Carbo Ligni.
21. Chromii et Potassii Sulphas.
22. Magnesii Oxidum.
23. Magnesii Sulphas.
24. Plumbi Oxidum.
25. Potassii Carbonas.
26. Potassii Chloridum.
27. Potassii Citras.
28. Potassii Dichromas.
29. Potassii et Sodii Tartras.
30. Potassii Hypophosphis.
31. Potassii Nitras.
32. Potassii Sulphas.
33. Potassii Sulphurata.
34. Pulvis Aromaticus.
35. Pulvis Cascaræ Sagradæ.
36. Pulvis Rhei.
37. Pulvis Scillæ.
38. Pulvis Tragacanthæ.
39. Quinina.
40. Quininae Bisulphas.
41. Quininae Chlorhydrosulphas.
42. Quininae Hydrobromidum.
43. Quininae Hydrochloridum.
44. Renninum.
45. Saccharum.
46. Saccharum Lactis.
47. Sodii Benzoas.
48. Sodii Bicarbons.
49. Sodii Boras.
50. Sodii Bromidum.
51. Sodii Carbonas Monohydratus.
52. Sodii Chloridum.
53. Sodii Citras.
54. Sodii Hydroxidum.
55. Sodii Hypophosphis.
56. Sodii Iodidum.
57. Sodii Nitras.

## 500 gram (1 pound)—Continued.

58. Sodii Nitris.
  59. Sodii Sulphas.
  60. Sodii Sulphis.
  61. Sulphur Lotum.
  62. Sulphur Precipitatum.
  63. Sulphur Sublimatum.
  64. Talcum Purificatum.
  65. Terpini Hydras.
  66. Zinci Carbonas Precipitatus.
  67. Zinci Oxidum.
  68. Zinci Stearas.
- 250 gram ( $\frac{1}{2}$  pound) :
1. Acacia.
  2. Acidum Citricum.
  3. Acidum Tannicum.
  4. Acidum Tartaricum.
  5. Ammonii Carbonas.
  6. Ammonii Chloridum.
  7. Ammonii Valeras.
  8. Amylum.
  9. Calcii Lactas.
  10. Camphora.
  11. Creta Praeparata.
  12. Extractum Glycyrrhizæ.
  13. Ferri Phosphas.
  14. Hydrargyri Chloridum Corrosivum.
  15. Hydrargyrum Ammoniatum.
  16. Lycopodium.
  17. Pancreatinum.
  18. Plumbi Acetas.
  19. Potassii Acetas.
  20. Potassii Bicarbons.
  21. Potassii Bitartras.
  22. Potassii Bromidum.
  23. Potassii Chloras.
  24. Potassii Hydroxidum.
  25. Potassii Iodidum.
  26. Pulvis Cinnamomi.
  27. Pulvis Cretæ Compositus.
  28. Pulvis Digitalis.
  29. Pulvis Gallæ.
  30. Pulvis Glycyrrhizæ Compositus.
  31. Pulvis Rhei Compositus.
  32. Quininae Sulphas.
  33. Resorcinol.
  34. Santalum Rubrum.
  35. Sodii Phosphas.
  36. Sodii Salicylas.

## LIST OF SHELF BOTTLES—continued.

## 120 gram (4 ounces) :

1. Acetanilidum.
2. Acetphenetidinum.
3. Acidum Acetylsalicylicum.
4. Acidum Gallicum.
5. Acidum Picricum.
6. Acidum Salicylicum.
7. Aloe.
8. Ammonii Bromidum.
9. Antimonii et Potassii Tartras.
10. Antipyrina.
11. Argenti Nitras.
12. Argenti Nitras Fusus.
13. Caffeina Citrata.
14. Caffeinae Sodio-Benzozas.
15. Camphora Monobromata.
16. Cerii Oxalas.
17. Chromii Trioxidum.
18. Chrysarobinum.
19. Cupri Sulphas.
20. Coccus.
21. Diastasum.
22. Diethyl-malonyl-urea.
23. Extractum Belladonnae Foliorum.
24. Extractum Colocynthis Compositum.
25. Extractum Fellis Bovis.
26. Extractum Rhei.
27. Ferri et Quininae Citras.
28. Ferri Phosphas.
29. Ferri Sulphas Exsiccatus.
30. Ferrum Reductum.
31. Hexamethylenamina.
32. Hydrargyri Chloridum Mite.
33. Hydrargyri Iodidum Flavum.
34. Hydrargyri Iodidum Rubrum.
35. Hydrargyri Oxidum Flavum.
36. Hydrargyri Salicylas.
37. Hydrargyri cum Creta.
38. Iodoformum.
39. Iodum.
40. Lithii Citras.

## 120 gram (4 ounces)—Continued.

41. Menthol.
42. Methylthioninae Chloridum.
43. Pepsinum.
44. Phenolphthaleinum.
45. Phenylis Salicylas.
46. Potassii Permanganas.
47. Pulvis Caryophylli.
48. Pulvis Capsici.
49. Pulvis Ipecacuanhae.
50. Pulvis Ipecacuanhae et Opii.
51. Salicinum.
52. Santoninum.
53. Sulphonethylmethanum.
54. Sulphonmethanum.
55. Thymol.
56. Thymolis Iodidum.
57. Zinci Phenolsulphonas.
58. Zinci Sulphas.

## 60 gram (2 ounces) :

1. Aethylmorphinae Hydrochloridum.
2. Aloinum.
3. Atropinae Sulphas.
4. Berberinae Hydrochloras.
5. Betaeucainaе Hydrochloridum.
6. Caffeina.
7. Chloralum Hydratum.
8. Cocainaе Hydrochloridum.
9. Codeina.
10. Codeinae Sulphas.
11. Diacetylmorphinae Hydrochloridum.
12. Extractum Nucis Vomicae.
13. Extractum Opii.
14. Morphinae Sulphas.
15. Novocain.
16. Pilocarpinae Hydrochloridum.
17. Sparteinae Sulphas.
18. Strychninae.
19. Strychninae Sulphas.
20. Tinctura Cannabis.
21. Tinctura Opii.
22. Tinctura Opii Deodorati.

## COUNTER SCALE.

The prescription balance must not be used for weighing substances over one-half ounce, as that would tend to reduce its sensibility, but as it is necessary to weigh larger amounts it is recommended that a scale with an 8 to 10 pound capacity be requested.



*Specifications.*—One scale, agate frame, glass box, with agate bearings; frame, ends, and top to be of beveled glass; the frames to be of mahogany and workmanship of the highest order. The inside to be finished in nickel; all working parts to be set with Russian agates; size of pan, 9 inches; capacity, 8 pounds; sensibility, 20 grains. Estimated cost, \$20.

#### PREScription BALANCE.

It is necessary for the accurate compounding of prescriptions that the dispensary be furnished with the most modern and sensitive balance on the market. The torsion balance has satisfactorily been used for several years, but one manufactured by Henry Troemner, of Philadelphia, Pa., is a better balance, as the parts are not very easily put out of order.

*Specifications.*—One plate glass box prescription scale. The scale to be inclosed with beveled plate glass box; the works to be of brass and nickel plated, and the bearing to be of agate; the scale is to be provided with a side beam graduated in the top row from one-tenth grain up to 15 grains; the bottom row divided from 1 centigram to 1 gram; the rider on the side beam to be worked from the outside right-hand side of the case by an automatic lift rider carriage; capacity, one-half ounce; sensibility, one-tenth of a grain; dimension of pans, 3 inches; outside dimension, 12 by 7 by 8½ inches high. Estimated cost, \$40.

#### WEIGHTS.

*Specifications.*—One set of prescription weights from 2 drams to one-tenth grain; the block to be of mahogany with hinged lid and separate holes in the block for the weights. The weights from 10 grains to one-tenth grain to be of aluminum. The dram and scruple weights to be of brass, and coin-shaped. Forceps for handling weights to be fitted in block. Estimated cost, \$2.

One set of block weights from one-sixteenth ounce to 2 pounds; to be in polished hardwood block and made of brass, with separate holes in the block for the weights. Estimated cost, \$9.

One set of metric block weights from 1 gram to 1 kilogram; to be in polished hardwood block and made of brass, with separate holes in the block for the weights. Estimated cost, \$9.

One set gram weights, from 1 centigram to 50 grams, in covered hardwood box, with hinged lid and separate holes in the block for the weights; the weights below the gram to be of aluminum and those above to be of brass. Estimated cost, \$4.

#### REFRIGERATOR.

The proper care of sera and vaccines requires a special chest refrigerator be constructed to meet the requirements of the hospital, and it is well to have it conveniently placed near the dispensary and directly connected with the main draining system.

It has heretofore been the custom in many naval hospitals to keep sera and vaccines, together with other dispensary articles required to be kept cool, in the refrigerating plant of the commissary department. This is obviously inconvenient and impractical and efficiency requires a chest refrigerator for dispensary use only; this would tend to centralize responsibility which is essential to a large naval hospital and at the same time enable the pharmacist to be better acquainted with the quantity and quality of stock on hand at all times.

An alphabetical list of the contents of the chest may be made and secured to the outer side of the inside cover of the chest and each shelf may be lettered

or numbered as desired. The letter or number of each shelf containing a certain article should appear opposite the name of that article on the alphabetical list. This arrangement would insure the immediate finding of any article in the chest and also give one who is not familiar with the stock information as to the contents of the chest.

*Specifications.*—The chest refrigerator to be 52 inches long; 24½ inches deep, and 33½ inches high (caster included); to be so constructed that there be a separate ice chamber and cover; thick wall and slate-stone shelves with steel ice rack and lock; the ice chamber to be placed at one end and separated from the sera and vaccine chamber by a partition with passages for the circulation of cold air; to have four slate shelves. Estimated cost including drip pan (when not connected with main drainage), \$30.

#### COMBUSTIBLE CELLAR.

Large amounts of chloroform, ether, and other combustibles, especially during war times, are stored in naval hospitals, and for reasons of safety it is urgent that they be placed in a separate storehouse made of fireproof material or in a concrete storage pit, depending, of course, upon the surrounding country. If the land adjacent to the hospital be level an ordinary fireproof structure may be erected, but if terraced a concrete storage pit is most desirable.

*Specifications.*—The pit to be located approximately 50 feet from the nearest hospital building and to be built in an embankment with the front of the pit of the same slope as the finish grade of the terrace, the top of the pit being about 16 inches below grade of the top of the terrace; the inside dimension to be 8 feet wide by 10 feet long, 6 feet 6 inches high. The walls, roof, and floor slabs to be constructed of concrete and to consist of a mixture of one part of cement, two parts of sand and four parts of stone; the walls to be 12 inches thick and reinforced with three-eighths inch temperature rods which run horizontally and vertically 18 inches on centers. Roof slab to be 5 inches thick and reinforced with three-eighths rods, 6 inches on centers, and run in both directions. Floor to be 5 inches thick and three-quarter inch wearing finish, composed of one part cement and two parts sand. Entrance doors to be 2 feet 6 inches wide by 4 feet 6 inches long, and constructed of steel plates one-eighth inch thick with stiffening steel bars riveted to backs and securely hinged and bolted to the sloping face of the pit with extra-strong strap hinges. The doors to be provided with padlock. A cast-iron cesspool floor drain to be installed in the center of the room with floor sloping to same. A finish cast-iron vent pipe to be constructed in the center of the ceiling and to project above the finish grade with approved cap to prevent trash and rain from entering the pit. All walls, ceiling, and floor to be thoroughly waterproof with 5-ply tar and felt. Estimated cost, including labor, \$400.

#### NARCOTIC LOCKER.

Naval Regulations and the Manual for the Medical Department prescribe that narcotics shall be stored in a separate locker, under lock and key, which shall be in the custody of an officer at all times. This locker shall contain only narcotics and other strongly poisonous drugs and chemicals; alcohol and liquor shall be stored in the combustible cellar. A very small amount of these drugs and chemicals, for immediate use only, may be kept in the prescription case, but also under lock and key. As the pharmacist is the responsible head of the dispensary and is accountable to the commanding officer



for its efficient management, he shall at all times have the key to the narcotic locker in his possession.

*Specifications.*—One narcotic locker to be 3 feet wide, 7 feet high, and 2 feet deep, inside measurements. Material to be  $1\frac{1}{2}$  by  $1\frac{1}{2}$  by  $\frac{1}{8}$  inch angle iron, all corners to be securely riveted with  $\frac{3}{8}$ -inch rivets. Sheet metal to be  $\frac{1}{8}$ -inch black iron sheet steel firmly riveted to the frame and calked water-tight, sheet to be on the inside and allowing angle-iron frame to provide an outside finish.

The doors to be of  $\frac{1}{4}$ -inch black iron with three hinges on each door, not less than 4-inch butt and  $\frac{1}{2}$ -inch pin. Hinges to be riveted to frame with not less than  $\frac{1}{8}$ -inch rivets with reinforcing strip on angle frame. Shelving to be of  $\frac{1}{4}$ -inch iron sheet, edge to be flanged to  $90^\circ$  to prevent sagging. To be adjustable on racks with 1-inch divisions and seven shelves 18 inches wide to be provided, allowing 18 inches standing room in front of shelves. Estimated cost: \$75.

## GRADUATES.

Form B furnishes graduates from 5 mils to 500 mils, which are sufficient for ordinary work, but a dispensary in a large hospital requires a larger and better assortment of graduates in both the apothecary and metric systems.

2 1,000 mil	\$2.50
2 60 minim	.90
2 1 ounce	.95
2 2 ounce	1.10
2 4 ounce	1.50
2 8 ounce	1.75
2 16 ounce	2.25
2 32 ounce	2.50
2 500 mils (cylindrical)	3.00
2 1,000 mils (cylindrical)	4.00
Total	20.45

*Specifications.*—The glass in the above graduates to be light and strong and of a brilliant finish; the lines to be clear cut and distinct and the figures and letters to be engraved by hand.

## PERCOLATORS.

2 glass percolators, capacity one-half gallon	\$2.00
2 glass percolators, capacity one gallon	3.00
Total	5.00

*Specifications.*—The same as for the above graduates.

## FUNNELS.

2 1-ounce glass funnels, 2-inch diameter	\$0.50
2 4-ounce glass funnels, 3 $\frac{1}{4}$ -inch diameter	.75
2 16-ounce glass funnels, 5 $\frac{1}{2}$ -inch diameter	.90
2 32-ounce glass funnels, 7-inch diameter	1.25
2 $\frac{1}{2}$ -gallon glass funnels, 8 $\frac{1}{2}$ -inch diameter	1.00
2 1-gallon glass funnels, 10 $\frac{1}{2}$ -inch diameter	2.25
Total	7.15

*Specifications.*—The above funnels to be ground off at the top and at an angle of 60°. Half of the number of funnels to be plain pressed and the other half to be ribbed pressed.

## WEDGWOOD MORTARS AND PESTLES.

There are but two sizes of Wedgwood mortars and pestles on the supply table; the following are also required:

1 12-inch Wedgwood mortar and pestle, 1½-gallon capacity..... \$4.00

## PORCELAIN MORTAR AND PESTLE.

2 4-inch, 5-ounce, deep shape, mortar and pestle..... \$1.50  
 2 5-inch, 1-pint, deep shape, mortar and pestle..... 3.00  
 2 4½-inch, ¾-pint, shallow shape, mortar and pestle..... 1.50  
 Total ..... 6.00

## GLASS MORTARS AND PESTLES.

2 4-ounce glass mortars and pestles..... \$0.85  
 2 16-ounce glass mortars and pestles..... 1.90  
 Total ..... 2.75

## WEDGWOOD PILL PESTLE.

2 pill pestles, Wedgwood..... \$1.00

*Specifications.*—To be 8 inches long, with rounded end, and suitable for making pill mass in mortar.

## EVAPORATING DISHES.

1 3½-inch porcelain evaporating dish, 2 ounce..... \$2.00  
 1 5½-inch porcelain evaporating dish, 7 ounce..... 2.50  
 1 6½-inch porcelain evaporating dish, 1 pint..... 3.00  
 Total ..... 7.50

*Specifications.*—To be of porcelain and glassed on the inside with heavy rim around the top.

## WATER BATH.

1 10-inch water bath, with seven rings..... \$9.00

*Specifications.*—To be of polished copper, tin-lined, with concentric copper rings, cover, and steam escape.

## PILL SPATULAS.

2 2½-inch pill spatulas..... \$1.20  
 2 3½-inch pill spatulas..... 1.60  
 Total ..... 2.80

*Specifications.*—To be of short stiff steel blades with ebony handles. (These are in addition to those furnished on Form B.)



## HARD-RUBBER SPATULAS.

1 4-inch hard hubber spatula-----	\$0.00
1 6-inch hard rubber spatula-----	.75
Total -----	1.25

*Specifications.*—To be in one piece and with a handle.

## PILL MACHINE.

1 pill machine -----	\$7.00
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*Specifications.*—To be made with brass plate and sides; side rollers and walnut rolling board. To make 24 3-grain pills.

## PILL ROLLER.

1 polished boxwood pill roller-----	\$0.50
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## PILL TILES.

Form B furnishes porcelain pill tiles and the prescription case is constructed with three pill tiles; it will therefore be unnecessary to make special requisition for any.

## POWDER FOLDERS.

1 powder folder-----	\$2.00
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*Specifications.*—To be nickel plated and capable of expanding.

## SEIDLITZ POWDER MEASURES.

2 Seidlitz powder measures, of polished boxwood-----	\$1.00
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## SUPPOSITORY MACHINE.

1 suppository machine-----	\$15.00
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*Specifications.*—To be furnished with a set of molds for making suppositories of three sizes, viz., 15-grain, 30-grain and vaginal; with six molds for making bougies; the molds to be of brass and to be screwed into the end of the cylinder; to be complete with nine molds.

*NOTE.*—The suppository mold on the supply table does not meet every requirement; the above specifications will furnish a suitable suppository machine.

## TABLET MOLD.

1 tablet mold-----	\$3.00
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*Specifications.*—To be of hard rubber and capable of making 50 one-grain tablet triturates.

## PRESCRIPTION SIEVE.

1 prescription sieve-----	\$1.00
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*Specifications.*—The frame to be of aluminum and the sieve of brass wire and to be in three parts. Dimensions  $5\frac{1}{2}$  by 3 inches.

## BRASS SIEVES.

1 brass sieve, 6-inch, 80-mesh	\$1.75
1 brass sieve, 8-inch, 60-mesh	2.00
Total	3.75

*Specifications.*—To be of brass wire cloth with lacquered tin frames.

## GLASS STIRRING RODS.

12 12-inch glass stirring rods	\$1.00
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## HARD-RUBBER STIRRING RODS.

6 10-inch hard-rubber stirring rods, flat end	\$1.25
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## GRADUATE BRUSHES.

12 11-inch graduate brushes	\$3.50
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## IRON TRIPOD.

1 iron tripod	\$1.00
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*Specifications.*—To be of galvanized iron, 7½ inches high; ring 4½ inches in diameter and with adjustable lamp brackets.

## BUNSEN BURNER.

1 Bunsen burner	\$2.50
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*Specifications.*—To be of brass on an iron base with stop to regulate the admixture of air; the brass tip inside of tube to be adjusted to regulate the flow of gas; also adjustable for burning of gases of various qualities.

## PRESCRIPTION NUMBERING MACHINE.

1 prescription numbering machine	\$7.00
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*Specifications.*—To be of case-bronze frame, steel wheels, and the figures to be engraved; to have six wheels and to be capable of consecutive, duplicating, and repeating movements entirely automatic.

## RECAPITULATION OF DISPENSARY EQUIPMENT.

Wall casings	\$540.00
Prescription case	170.00
Manufacturing counter	60.00
Top for manufacturing counter	30.00
Top for prescription case	27.00
Drug cans	16.00
Ointment jars	25.00
Shelf bottles	120.00
Glass labels for shelf bottles	100.00
Prescription balance	40.00
Counter scale	45.00
Weights, apothecary, and metric	24.00
Graduates, assorted	20.45
Percolators	5.00
Funnels, glass	7.15
Mortars and pestles, Wedgwood	4.00



Mortars and pestles, porcelain	86.00
Mortars and pestles, glass	2.75
Pestle, pill	1.00
Dishes, evaporating	7.50
Water bath	9.00
Spatulas, pill	2.80
Spatulas, hard rubber	1.25
Pill machine	7.00
Pill roller	.50
Powder folders	2.00
Seidlitz-powder measures	1.00
Suppository machine	15.00
Tablet mould	3.00
Sieve, prescription	1.00
Sieves, brass	3.75
Stirring rods, glass	1.00
Stirring rods, hard rubber	1.25
Brushes, graduate	3.50
Tripod, iron	1.00
Bunsen burner	2.50
Numbering machine for prescriptions	7.00
Refrigerator	30.00
Combustible cellar	400.00
Narcotic locker	75.00
Total	1,818.50

NOTE.—The estimated cost for the drug fixtures includes delivery and setting up; the estimated cost for the combustible cellar and narcotic locker includes both labor and material, and it is suggested that in making requisition for the above, special notation be made on the face of the requisition that the estimated cost includes labor.

## PAPER NO. 11.

### PROBLEM.

It is assumed that a new permanent naval hospital is to be placed in commission.

You are called upon to select and purchase complete X-ray equipment.

Give a complete list of such equipment, a brief description of the articles, the approximate cost of each, and of complete equipment, and if possible names and addresses of firms from whom each article may be obtained.

### ANSWER TO No. 11.

#### X-RAY EQUIPMENT.

The chief object which it was hoped to attain through the medium of question No. 11 has been quite fully accomplished. This object

was to prompt the participants in the course to investigate for themselves the integral parts of a complete, modern outfit for performing all radiographic procedures; to ascertain where and how the equipment might be obtained in open market; and to bring you in touch with dealers so that their catalogues would become a reference library wherein you might seek for those items which your future experience may show to be necessary to the proper performance of the various details of X-ray manipulations.

The question calls for the selection and purchase of X-Ray equipment. This includes neither high frequency nor electrotherapeutic apparatus, other than certain vacuum tubes which may be used for treatment of certain lesions. These tubes form part of the regular outfit, and are not procured especially for treatment purposes.

Experience in radiographic manipulations has shown that possession of all the items enumerated below is most desirable, although, perhaps, not absolutely essential. In July, 1917, the Council of National Defense published, under the heading of "Staple medical and surgical supplies," part 4, the items of a representative radiographic outfit which had been selected by a board of medical officers from the Army, Navy, Public Health Service, and American Red Cross Association to meet war conditions. While that outfit may be considered as a standard one, well fitted to meet every requirement of the service, it is not identical with the "Navy Standard X-ray outfit" shown below, and which would be furnished by the Bureau of Medicine and Surgery should requisition be made for such.

When manufacturers are asked for proposals to furnish this equipment, the specifications sent out from the Bureau will be as shown. For the convenience of bidders, the equipment is separated under five headings. No Coolidge tubes are shown on this list because they can be obtained only from the General Electric Co., Schenectady, N. Y. Manufacturers would not be asked to bid for their supply because a special arrangement for that purpose has been made between the Navy Department and the company.

*Standard X-ray outfit (Navy), in accordance with the following specifications.*

CLASS I.—STATIONARY X-RAY MACHINE AND CONTROLLING DEVICE.

Item 1. One 12 kilowatts, 220 volts, direct-current, interruptless high-tension transformer type X-ray machine, with synchronous self-starting motor, to be complete and of the highest efficiency, with variable inductance; equipped with third terminal, automatic time switch, volt meter to measure voltage across X-ray tube terminals, milli-ampere meter, pilot light, foot switch of the four-contact type, and other necessary controlling devices, suitably mounted on controlling table or panel, and connected to the apparatus by cable----- \$1,400



- Item 2. One lead screen with lead glass window, to be mounted on wheels, or permanently installed to afford adequate protection to the operator in suitable position for the convenient operation of the apparatus during roentgenographic or fluoroscopic work. Approximate cost-----
- Item 3. Three 7-inch tungsten target tubes, transformer type, of highest efficiency-----

\$100

125

## CLASS II.—ROENTGEN EXAMINING TABLE AND ACCESSORIES.

- Item 4. One combination Roentgen examining and plate-changing table, tube tilt, with balanced tube stand, lead glass bowl, fluoroscopic screen, automatic screen attachment. The outfit to be complete, including plate-changing tunnels for plates up to and including 14 by 17 inches, tube-holding box under the table and tube stand mounted on the table or on a separate floor base, both with attachments for both Coolidge and gas tubes. The table shall permit work conveniently with a patient in any position from Trendelenberg to the vertical, for either fluoroscopic or plate work, the latter single and stereoscopic; permitting loading and shifting of plates, shifting of tube, and other adjustments to be made from one and the same side. Table must be operable in a clearance of 7 feet 3 inches-----
- Item 5. One overhead trolley system, including necessary bronze wire, brass turnbuckles, trolley reels, plain, trolley reels, double Coolidge, insulators and supporters complete-----

\$1,200

35

## CLASS III.—ACCESSORIES FOR X-RAY ROOM AND CONSULTING ROOMS.

- Item 6. 1 apron, lead, protective, leather straps-----
- Item 7. 12 carriers, plate, core 10 by 12 inches size; Monel metal-----
- Item 8. 6 carriers, plate, core 14 by 17 inches size; Monel metal-----
- Item 9. 24 clips, paper, for dental films-----
- Item 10. 1 box, lead lined, for the protection of plates from X-rays; 10 by 20 by 18 inches deep-----
- Item 11. 1 pair gloves, opaque, protective-----
- Item 12. 1 pair goggles, welder's-----
- Item 13. 10 pounds lead foil, medium thickness-----
- Item 14. 1 sheep's skin-----
- Item 15. 1 Benoist scale-----
- Item 16. 2 lamps, incandescent blue, with pull switches-----
- Item 17. 4 sets numbers, lead,  $\frac{1}{2}$ -inch, from 1 to 0-----
- Item 18. 100 negative preservers for 14 by 17 inch plates; 100 for 10 by 12 inch plates; 400 for 8 by 10 inch plates; 200 for 5 by 7 inch plates-----
- Item 19. 1 tube rack, wood, for holding five 7-inch X-ray tubes-----
- Item 20. 1 Wedgwood, 12 by 12 by 3 inches, angle  $27^{\circ}$ -----
- Item 21. 1 stereoscope, Wheatstone type, furnished with four 100-watt nitrogen lamps, and regulated by dimmers permitting of gradual regulation-----
- Item 22. 3 intensifying screens, each with cassette; one for 14 by 17 inch plates, and two for 8 by 10 inch plates-----

\$10.20

15.12

9.45

2.40

18.00

10.20

2.20

3.20

3.00

1.80

6.30

1.60

4.00

4.20

2.00

93.15

118.00

## CLASS IV.—DARK ROOM EQUIPMENT.

Item 23.	1 combination stone, or enameled metal, developing, fixing, and washing tank for plates up to and including 14 by 17 inches with frames for holding plates.....	\$49.50
Item 24.	1 drying rack for negatives up to and including 14 by 17 inches.....	1.00
Item 25.	2 dark room, safe lights, ruby, Eastman Kodak Co.'s Wratten Safe Light, with two openings, each 8 by 10 inches, one ruby and one white.....	16.20
Item 26.	1 thermometer, bath.....	1.40
Item 27.	2 trays, enameled ware, for 14 by 17 inch plates.....	6.30
Item 28.	2 trays, enamel ware, for 10 by 12 inch plates.....	2.97
Item 29.	2 trays, enamel ware, for 8 by 10 inch plates.....	2.25
Item 30.	1 tray rocker, electric.....	45.00
Item 31.	1 scales, photographer's.....	2.70
Item 32.	6 32-ounce salt-mouth bottles.....	4.50
Item 33.	1 16-ounce graduate.....	.50
Item 34.	1 8-ounce glass graduate.....	.33
Item 35.	1 4-ounce glass graduate.....	.25
Item 36.	2 pitchers, enamel ware, 2 quarts.....	3.00
Item 37.	2 crocks, stoneware, 5 gallons.....	3.50
Item 38.	1 brush, camel's hair, 3 inches.....	1.00
Item 39.	5 pounds barium sulphate, for X-ray diagnosis.....	3.00
Item 40.	2 pounds chrome alum.....	1.20
Item 41.	6 pounds hydroquinone.....	45.00
Item 42.	$\frac{1}{4}$ pound metol (or substitute).....	6.00
Item 43.	10 pounds sodium carbonate (photographic).....	1.90
Item 44.	50 pounds sodium hyposulphite.....	2.50
Item 45.	5 pounds sodium sulphite (photographic).....	1.20
Item 46.	$\frac{1}{2}$ pound potassium bromide.....	1.10
Item 47.	$\frac{1}{2}$ gross films, dental, $1\frac{1}{2}$ by $2\frac{1}{2}$ inches.....	4.50
Item 48.	$\frac{1}{2}$ gross films, dental, $1\frac{1}{2}$ by $1\frac{1}{2}$ inches.....	2.70
Item 49.	4 dozen X-ray plates, standard make, size 14 by 17 inches.....	30.60
Item 50.	4 dozen X-ray plates, standard make, size 10 by 12 inches.....	14.28
Item 51.	10 dozen X-ray plates, standard make, size 8 by 10 inches.....	20.40
Item 52.	5 dozen X-ray plates, standard make, size 5 by 7 inches.....	4.68

## CLASS V.—COOLIDGE TUBE ACCESSORIES.

Item 53.	One suitable apparatus for operating a Coolidge tube, storage battery or Coolidge tube transformer, the latter stepping down from 220 volts to the potential suitable for operating tubes at their highest efficiency; high tension switches, Coolidge equipped; insulating stand for tube, transformer, and ammeter; ammeter for Coolidge tube filament circuit; primary current control device of either resistance or impedance type, and reels.....	\$161.20
Total cost.....		3,606.08

NOTE.—On all proposals: All items to be delivered free of all delivery charges to the United States Naval Hospital —, subject to the inspection and acceptance of the medical officer in command.

The apparatus under item 1 must be put in place, given a suitable test, and left in satisfactory running order. The test may include any work in the field



of hard or soft tissue work required by the medical officer in command of the hospital. A complete set of blue prints showing the details and the wiring of the apparatus will be furnished by the contractor. Under item 1, contractor may combine item 2 as a part of item 1 in such manner as may economize floor space.

Following is a partial list of manufacturers and dealers in X-ray machinery and equipment:

Wappler Electric Manufacturing Co. (Inc.), New York.	V. Mueller & Co., Chicago.
Victor Electrical Corporation, New York.	McDermott Surgical Instrument Co., New Orleans.
Scheidel-Western X-Ray Coil Co., Chi- cago.	American X-Ray Equipment Co., New York.
Snook Roentgen Manufacturing Co., Philadelphia.	Kelly-Koett Manufacturing Co., Cor- ington, Ky.

## PREPARATION OF MANUSCRIPTS FOR PRESS.

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Manuscripts accepted and prepared for press are designated "Copy."

Copy must be on one side of the paper only.

*Double spacing and margin are essential* in copy in order to leave room for corrections or change and for adding directions to the printer.

Manuscript corrections should be made at the site of the error, whereas corrections of proof are indicated in the margin.

The sign "%" on the typewriter is for commercial correspondence. Every time the typist uses the sign to save himself time and labor he imposes on the editor the task of erasing it and writing in *per cent.*

Do *not* underline headings or captions as underlining is a direction to the printer to use *italics*. Leave ample space above and below all headings for the directions as to type, etc.

In most of our Government publications we follow precedent and established routine. Hence, it is well to look up the forms used in previous numbers or editions. Thus, after a title of a paper on the next line put "By," followed by *initials, name, title, and corps.*

The writer and *not* the editor should verify the correctness of the name and designation.

Do not fasten sheets of manuscript together by a fastener which can not be easily removed without tearing the paper.

Do not use the form of official correspondence by which two or three spaces are left between paragraphs. Parenthetical marks then have to be added by the person preparing the copy for press. Do not number paragraphs as a routine procedure, but only when this is indicated in the text.

Avoid the use of capitals. Insist on having a dictionary accessible at all times, and never write a word about whose spelling you are in doubt.

Look up a good many words about which you have no doubt, and you will get some new ideas about spelling.



There are usually two proofs of an article, the *galley* and the *page*. Additions and changes in the galley have been corrected and the requested additions inserted in the page proofs. The corrections on additions made to page proof can not be verified, as the text is not seen again by the editor until the finished product is delivered.

The more inaccurate and careless the manuscript and the more numerous the necessary corrections, the greater the certainty of error in the printed work, since a certain proportion usually escapes detection.

